Course Syllabus

Strategic Management of Technology & Innovation

Spring 2016

9:30~12:00

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| Instructor: Vincent Kuo | Office: TR820 |
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| Office Hours: by request | |

Required Reading:

* Strategic Management of Technology and Innovation, 5th edition. Robert Burgelman, Clayton Christensen, Steven Wheelwright. McGraw-Hill.
* A series of cases available on Moudle system.

Recommended Reading:

You should also be familiar with these:

* Moore, Geoffrey A., *Crossing the Chasm*, Revised Edition, Collins Business, 2002. (Paperback)
* Christensen, Clayton M and Michael E. Raynor, *The Innovator’s Solution*, Harvard Business School Press, 2003.
* Christensen, Clayton M., *The Innovator’s Dilemma*, Collins Business, 2003. (Paperback) You should be familiar with this book already, but if not, please read it early in the course. Both the textbook and I will assume you know the basics.
* Schilling, Melissa A., Strategic Management of Technological Innovation, Third Edition, McGraw-Hill Irwin, 2010.

Course Objectives:

This course is meant to provide an overview of concepts and tools for thinking about and managing technology businesses. We emphasize the understanding and application of ways of thinking or models that help in the analysis, development and implementation of strategies for managing technology. The course requires a great deal of reading, thinking, and preparing for class discussion and assignments; if you intend to take this course you should commit sufficient time for preparation and participation.

Student Learning Outcomes: Upon completing this course, students should be able to

* Evaluate the commercial potential of a new technology that could be pursued by an existing organization
* Apply models of technology innovation to the analysis of an opportunity
* Describe alternative approaches to deal with identified issues related to the development of technology strategy
* Articulate and support a recommended course of action to implement a technology strategy

Course Structure:

You will achieve these objectives only if you participate in the learning that occurs both in the classroom and outside of class. In the first few sessions I will discuss the basics of strategic thoughts, but classes are not meant to be lectures. While I won’t lecture on the textbook content, you’ll be expected to have read and prepared the questions and cases. Most of our class time will be spent in discussing the readings, in class exercises and in case discussions. A significant part of your grade will be based on your attendance, preparation and participation in class discussions.

Most work in business is accomplished collaboratively, and this course is no exception. You should form study groups of maximum 4 people, and let me know the makeup of your group by the second class. If this isn’t done I reserve the right to make arbitrary assignments. Each group will be responsible for a course project, which includes an initial presentation to the class, an interim paper, and a final paper and presentation. Each group will also be responsible for presenting and leading one case discussion.

Attendance and Course participation: Due to the development of principles using case discussions in addition to assigned readings, attendance and participation will significantly affect your grade and, more importantly, both your own and your classmates' experience in the class. If you do miss a session, it is your responsibility to inform me beforehand and to find out from your teammates what you missed. Missing sessions without warning me in advance(other than an emergency situation) will have a major negative impact on your grade for class participation; if you expect to miss more than 3 sessions, you probably shouldn’t take the course. Also, grades for class participation will be awarded on the basis of the **quality** of the contribution, **not** the quantity – interesting questions can be as valuable as interesting answers.

Everyone should be prepared to answer questions and discuss the readings and cases assigned for the current class, regardless of whether you’re responsible for a presentation. I’ll call on everyone in the class randomly during the term, and your responses will be part of your class participation grade component.

Please bring name cards, and sit with your own group.

Up to 10% of your grade will depend on peer review. Each of you will rate your teammates’ contributions to your projects, as well as your own. Everyone will also provide ratings for each of the other teams’ project presentations, which of course requires that you attend and hear them.

Quizzes: There will be short exams at exactly **9:30** in three class sessions (unannounced). These exams will cover any topics that have been discussed in readings, lectures, or in class up to that date (including guest speakers). I will ignore the lowest quiz grade – the remaining two will account for 20% of your grade.

Cases: Cases will be assigned for most class meetings, and I will lead the first one or two. Discussion questions will be released (5 days) prior to the class; everyone should prepare each case, with written conclusions for your own good. Preparation requires the identification of key issues, problems, and opportunities; the articulation and evaluation of alternative approaches to deal with the identified problems; the selection of a preferred strategy; and the formulation of a concrete action plan to implement the strategy. From the discussion in class of different approaches, we will highlight the nature of the tradeoffs, the importance of assumptions and personal values in the decision-making process, and the usefulness and limitations of an analytical approach.

When I lead a case, I will ask one or more of you to start the discussion by reviewing the facts or answering one of the assigned questions about the case; anyone who has thoroughly prepared the case should be able to handle a lead-off question. After a few minutes of initial analysis, we will open the discussion to the rest of the class. As a group, we will then build an analysis of the situation and address the problems and issues presented in the case. We will also spend time discussing the implementation of those recommendations.

When your group leads a case discussion, the team should provide me with your written analysis and recommendations before the class session. (This does not have to be a formal paper; an outline of your conclusions and the analysis you used to support them will be sufficient.) You will present to the class a brief initial summary of the case and its issues (15 minute presentation at most), then you will lead the class discussion to elicit additional thoughts, different assumptions, and development and support of alternative recommendations. You may call on classmates to discuss specific points, but this is not a substitute for your own team’s preparation. I will also call on you and other classmates for specific issues. If the analysis and recommendations developed in class are different from your written conclusions, that’s fine – there is seldom a single correct answer. A case presentation and discussion should take about an hour.

Course Project:

The project will represent the major component of your work, and your grade, for the course. Each group will collaborate on developing strategic analysis and recommendations for implementation for a specific technology domain (*def*: specified sphere of activity or knowledge) of your choice. You may choose a technology being worked on at your present or former company, or one that you’re interested in learning about. Before the fourth class you should send me a one-paragraph proposal for your technology domain for my approval.

There will be several deliverables for the project:

1. A technology brief: a class presentation of no more than 15 minutes, presented during the fifth class session:
   * Why is this technology and its domain interesting and important?
   * What stage of evolution is the technology and its domain in now, and what are the major points of its development history? What are the metrics that characterize each stage in its history, *e.g.,* performance metrics, number of companies, rate of penetration or adoption, type of technology, rate of technological change or innovation trajectory?
   * How have customer needs and segments evolved over time?
   * What are the key factors in diffusion and adoption in this domain now, and what do you anticipate them to be in the future?
   * How do you expect the key technologies in this domain to evolve? Are there likely to be natural technology limits, have there been or will there be significant disruptions? Why and when?

1. A strategic analysis of the domain’s history: a paper of no more than four (4) pages, due at the ninth class session, explaining:
   * How have companies in this domain captured the value created during each point of evolution?
   * What business models have worked, and which haven’t?
   * How important are uniqueness, resources, intellectual property or complementary assets? How significant are standards? How significant are network effects?
   * How do you anticipate that value creation in this domain may change in the future? What are the implications for the key players in this domain, and those affected by it?

1. The final deliverable will be an executive summary of your recommended strategy of no more than four (4) pages, plus a powerpoint deck, and a class presentation of 20 minutes max. The summary and slides will be due by the penultimate class session, and the presentations will occur during the last two classes. While the first two deliverables were descriptive, the final paper should be prescriptive. That is, you should focus on a specific player or players within the domain, and develop recommendations for its/their overall technology strategy with respect to a particular technology:
   * Review briefly the relevant content of the technology brief and the historical analysis
   * Provide recommendations for creating and capturing value, identify key decisions, and recommend how to deliver value (implementation, market approaches, competitive/collaborative issues, etc.)
   * Include the rationales for your recommendations, applying the models and analysis tools discussed in class. Identify any important assumptions that underlie your recommendations.

Here are a few examples of project topics in previous classes: Augmented reality; RFID for supply chain applications; BlueRay vs DVD-HD: a standards battle; DNA sequencing technology; smart phones; virtualization; cloud computing; digital printing for industrial applications.

Grading:

It is critically important to be able to articulate your thoughts clearly and succinctly in both written and oral presentations. Therefore the course requirements include both short (summary) papers and presentations; your grade will be determined not only by your analysis, assumptions, recommendations and supporting arguments, but also by how well you communicate them.

Grades will be determined by class participation, one case presentation, and by the course project. The case and project will be done in your group (the same group for all group assignments). Oral presentations of group work will be a group score for content and presentation.

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| Class participation | 25% |
| Peer review | 10% |
| Quizzes (best 2 of 3) | 20% |
| \*Case discussion lead | 10% |
| \*Technology brief presentation | 10% |
| \*Strategic analysis paper | 10% |
| \*Final Project paper & presentation | 15% |

\*Group Work

Schedule:

The Assignments and required readings are due on the day indicated; you should be prepared to discuss them intelligently. Case preparation was discussed earlier.

Note that this schedule is subject to change due to class enrollment, guest speaker scheduling and other real-time exigencies. Case assignment dates in particular may be adjusted; Blackboard will be kept updated.

**Course Schedule**

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| Date | Agenda/Learning materials |
| 2/25 | Orientation |
| 3/3 | Strategic Thoughts  Case 0: Amazon, Apple, Facebook and Google |
| 3/10 | *Industry Analysis*  Case 1: Emerging Nokia  Case 2: Auto-Graphic Inc. and the Library-automation industry |
| 3/17 | *Core competence and Organization*  Case 3: Philips versus Matsushita  Case 4: SAP - the challenge of aligning sourcing and innovation strategies |
| 3/24 | Technology brief by groups |
| 3/31 | *Strategy*  Case 5 & 6 :Google Inc. in 2014 |
| 4/7 | No class |
| 4/14 | *Business Model*  Case 7: Ebay and Amazon |
| 4/21 | *Monetization*  Case 8: Facebook |
| 4/28 | *Competing Technology*  Case 9: Tracking Freight Railcars in Indian Railway  Case 10: Ez-Link and Nets E-payment |
| 5/5 | *Network Effect and Standard*  Case 11: Entrepreneurs at Twitter  Case 12: LinkedIn Corporation, 2012  \*Submit strategic analysis paper |
| 5/12 | *Crossing the chasm and innovation ecosystem*  Case 13: FLYHT  Case 14: TESLA Motors: Disruption the Auto Industry |
| 5/19 | *New Product Introduction and Biomed*  Case 15: Calgene  Case 16: Abgenix and the XenoMouse |
| 5/26 | *Startup*  Case 17: Investorsoft  Case 18:Zaplet Inc |
| 6/2 | *Wrapping Up*  Case 19: Research in Motion: The Mobile OS Platform War  Case 20: Respond to Wii? The Sony case |
| 6/9 | Course Project presentations |