The Wharton School
UNIVERSITY OF PENNSYLVANIA
Department of Operations and Information Management

Syllabus for OPIM 613

Information and Information Based Strategy: Learning from History, Experience, and Economics

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Class Sessions: M, W 10:30-12:00 / M, W 3:00-4.30

Office Hours: M, T, W 2:00-3:00

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This course starts from six basic assumptions:

- Information technology has enabled a wide range of new business opportunities by reducing or eliminating barriers to entry, by changing the value of physical resources, and by creating virtual substitutes for those resources.
- And yet, there is very little that is entirely new in business. Basic objectives, such as differentiation, long-term competitive advantage, customer relationship management, and intelligent pricing strategies, are still essential. Even the apparently novel business model of Google is the model that was used by American and United Airlines to control search for and distribution of seats in the airline industry. Patterns repeat themselves.
- The set of relevant patterns has been changed by recent developments in the application of information and communications technologies, and by recent software strategies such as those followed by Capital One Bank, Facebook and MySpace, Google, and a range of companies that most of us have never followed.
- Strategic business problems often do not come nicely delineated, or clearly marked as problems in multi-echelon inventory management, or in pricing of a portfolio of product, or service offerings to multiple market segments, or indeed clearly labeled as requiring algorithmic problems in any single discipline.
- The skills needed to recognize business problems can be developed, based on a changing set of frequently occurring patterns. This course seeks to teach students how to recognize patterns, act as talented diagnosticians of business

strategy, and think about business strategy in ways appropriate to today's technology-enabled environment.

- This course is not about technology. It is about information and information-based strategy; it will use patterns, history, and information economics to teach you how to think about new competitive environments.

We focus on problem identification and on the development of sound strategic responses. More precisely, we focus on problems caused by rapidly changing conditions in the competitive environment, most frequently caused by changes in information technologies, and on the rapid development of competitive strategies to respond to those changes. We will develop in some detail how to respond, how the organization may need to change structurally, and how systems may need to change to reflect changes in organizational structure.

The course is intended to provide students with a set of skills that will be useful in careers in consulting and in strategic management. It can be seen as an introduction to the strategic use of information technology, with a focus on changes, threats, and opportunities resulting from changes in information availability. It draws on the professor's professional experience in diverse settings, in industries ranging from securities trading to the retailing of fast moving consumer goods. It is based in part on solving problems for and with clients, in settings ranging from start-ups to senior officers at the Pentagon, and locations ranging from London to Beijing. The course attempts to integrate this experience and the experience of students and of guest speakers with relevant theory; experience and theory can be combined to develop an approach to information-based strategies that is more general than that which can be derived from any location or any competitive setting. The course provides a focused and modern complement to the strategy courses normally taken in the management department.

All aspects of the firm — production, service, sales, marketing, and strategy — will be affected by changes in information cost and information availability. Clearly, some firms will win and others will lose; nearly all will have to change. And yet, fundamental laws of economics have not been repealed. This course uses economic theory and previous experience with rapid technological change, to provide insights for the development of strategy in an increasingly digital age.

Course Objectives

Students completing the course will have a sound theoretic framework for pursuing further studies in the area of information-based strategies, including eCommerce. They will understand how information technology affects the basic strategic options available, and will understand how firms and industries are likely to be affected. They will understand the often poorly structured process of evaluating potential systems innovations. They will be able to participate in strategic planning and systems planning because they will understand the relationships among them. The course is particularly recommended for students in strategic management and marketing, and for those interested in careers in consulting or who expect to manage portfolios of new technology companies. No background in technology or in technology management is required. Students completing this course will have mastered an understanding of the competitive implications of information technology and the fundamentals of the use of information in business.

Required Text

There will be a bulk pack of readings posted electronically rather than printed, so the actual volume of printed materials will be quite small. Readings for most classes are posted on the course website, in a set of folders with the date of each class. Each folder has the readings for that day.

Assignments and Grading

There will be several in-class case discussions in the course. Please note that all written assignments are shown in **RED** in the electronic version of the course syllabus. Dates when there are written assignments of any kind due are noted in **RED**, both in the session-by-session course outline and at the top of each day's page in the syllabus. Written assignments can all be done either ***individually*** or in ***groups of two or three*** students. Written assignments must be submitted online via the course website at the start of the class sessions in which they are due. Since assignments will usually be discussed in class on the date that they are due, it will not be possible to accept late assignments unless prior arrangements have been made. Please note that students will have to submit all five assignments if they do not wish to take the final examination.

The written assignments will determine 80% of your final grade, and the remaining 20% will be determined by class participation. Class participation grades will be based on the frequency and the quality of students' interactions in the classroom. Not surprisingly, a high grade in class participation will require class attendance. More importantly, a high grade in participation will require active engagement in classroom discussions, high quality responses to cold calls, and high quality interactions when the student volunteers rather than waiting to be called. Normally there is a final exam at the end of the course, but students who submit five of the six written assignments can waive the final exam since there will be enough information to evaluate them and determine a fair grade. If students submit all six homework assignments I will use only the top five to calculate their grades; the lowest grade will automatically be dropped. Students who are not satisfied with their grades on their written assignments will be able to take the OPTIONAL Final Exam, which will effectively replace their two lowest homework assignment grades, out of the remaining top five. Students who do less than five assignments will be required to take the final exam.

Color Coding in the Syllabus

A **bold red session heading** indicates that something is due at the beginning of the day's class.

Student Bios

Please send a word file containing a short biographical sketch, not a full resume, via email, to **clemons@wharton.upenn.edu**. Please title your attached file **613S14_I_NAME.doc**, where **I** is your first initial, and **NAME** is your last name. Please provide the following information:

- your expected concentration at Wharton
- your experiences relevant to the topics of this course
- your reasons for taking this course and what you hope to get out of it

Course Outline and Readings

Session 1 M 17-Mar **Course Introduction and Mechanics**
Information Changes Everything. Grading and course mechanics.

Session 2 W 19-Mar **Learning from the Experience of Others — The Power of Pattern Recognition**
Review of the science of business and the science of strategy formulation in the presence of discontinuous change, based on patterns observed over the past twenty years. Our first introduction to channel disruption.
Read: Clemons, **Financial Times**, Strategic Uncertainty
Read: Clemons, The Power of Patterns and Pattern Recognition When Developing Information-Based Strategy

Session 3 M 24-Mar **Versioning and the Power of Information**
Signaling, screening, masquerading, data mining, and regulatory complexity. Profit maximizing prices, with and without information.
Read: Akerlof, "The Market for Lemons"
Read Shapiro and Varian, **Information Rules**, Chapter 3, Versioning Information
Read: Friedman, **Hidden Order**, Chapter 10 Monopoly for Fun and Profit **(Optional)**
Read: Clemons, Marketing on the Net / Pricing Theory **(Optional)**

Session 4 W 26-Mar **Dealing with Information Asymmetry — Screening Mechanisms in Newly Vulnerable Markets**
Gaining competitive advantage through systems for market micro-segmentation and differential pricing; attempting to sustain advantage.
Read: Clemons and Thatcher, Capital One Case
HW1: Capital One Case Discussion and Written Analysis

Session 5 M 31-Mar **Hustle at a Discontinuity, followed by Platform Envelopment: Platform Envelopment and Resource-Based Sustainable Competitive Advantage**
Was the success of Rosenbluth International a fluke? What do we know about newly vulnerable markets and converting initial success into sustainable advantage? What do we known about channel disruption and channel stability over time? What do we know about platform extensions and resource-based competitive advantage? What does this tell us about Microsoft? What does this tell us about Google?
Read: Teece, Profiting from Technological Innovation
Read: Clemons and Row, Rosenbluth Travel Case
Visit: http://www.techcrunch.com/2009/03/01/what-an-antitrust-case-against-google-might-look-like/
http://kara.allthingsd.com/20091222/as-microsoft-warily-eyes-google-buying-spree-will-it-jump-in-or-play-the-regulatory-

card/
http://kara.allthingsd.com/20100726/yahoo-japan-confirms-google-switch-for-both-paid-and-algo-search/
http://techcrunch.com/2010/07/26/google-yelp/

HW2: Rosenbluth Travel Case Discussion and Written Analysis

Session 6 W 2-Apr **2-Sided Markets, Platform Envelopment, and Third Party Payer Business Models**

Third Party Payer business models appear to be a special case of what are now commonly called two sided markets. When are they dangerous? When are they ideal for consumers but dangerous? When are they ideal for all parties?

Read: "Why is There Still Litigation in Third Party Payer Distribution Systems in Air Travel", Huffington Post, 29 June 2011, http://www.huffingtonpost.com/eric-k-clemons/why-is-there-still-litiga_b_887252.html.

Read: "Third Party Payer Systems: The Most Significant Regulatory Problem in the Online World?", Huffington Post, 1 July 2011, http://www.huffingtonpost.com/eric-k-clemons/post_2164_b_888842.html.

Read: "The Need to Focus on the Correct Issues in Google, Power, and Antitrust", Huffington Post, 19 April 2011, http://www.huffingtonpost.com/eric-k-clemons/the-need-to-focus-on-the-_b_851102.html.

Read: "The Real and Inevitable Harm From Vertical Integration of Search Engine Providers Into Sales and Distribution", Huffington Post, 20 April 2011, http://www.huffingtonpost.com/eric-k-clemons/the-department-of-justice_b_851079.html.

Read: "The Google Consent Decree: Consumers Should Be Afraid, Be Very Afraid", Huffington Post, 21 April 2011, http://www.huffingtonpost.com/eric-k-clemons/post_1954_b_851696.html.

Session 7 M 7-Apr **The Power of Certainty — Resonance Marketing**

The role of increased information in the changing balance between cost-based strategies and value-based strategies, the changing advantage of incumbents, and the changing nature of competition.

Read: Clemons and Spitler, The New Language of Consumer Behavior

Read: Clemons, How Information Changes Consumer Behavior and How Consumer Behavior Determines Corporate Strategy

Read: Clemons and Gao, Consumer Informedness and Diverse Consumer Purchasing Behaviors (Optional)

Visit: http://www.forbes.com/opinions/2007/12/11/consumer-internet-buying-oped-cx_ekc_1212webbuying.html

HW3: Written Analysis — The Logic of Resonance Marketing

Session 8 W 9-Apr **Information Goods as a Strategy — Monetizing the Net beyond Advertising**

Current acquisitions of social network websites and user content websites have generated considerable interest and huge bids from media companies. Is this the big play in the next round of internet-based companies or simply the next round of dotcom silliness? How can *the net be used to generate revenues and profits? Surely there must be* something *other than advertising!*

Read: Clemons, Business Models for Monetizing Internet Applications and Websites: Experience, Theory, And Predictions

Visit: http://www.forbes.com/home/opinions/2007/08/22/social-nets-marketing-oped-cx_ekc_0823social.html

Visit: http://www.nytimes.com/2007/11/07/technology/07adco.html

Visit: http://www.techcrunch.com/2009/03/22/why-advertising-is-failing-on-the-internet/

HW4: Computational exercise on manipulation of search

Session 9 M 14-Apr **Making the Technology Investment Decision**

In some ways information technology investments are similar to other large capital investments with long lead times and resulting uncertainty; in other ways they have unique problems all their own. How do we value the upside? How do we value the downside and manage risks through options valuation? Return to the discussion of channel disruption.

Read: Clemons, Evaluation of Strategic Investments in Information Technology

Read: Clemons and Gu, Justifying Information Technology Investments: Balancing the Need for Speed With the Need for Certainty before Action

HW5: Computational exercise on business valuation

Session 10	W	16-Apr	**The *Why* of Outsourcing — Understanding the Changing Risk Profile of Outsourcing** *Information Systems and the structure of manufacturing operations — the changing balance between internal production and outside procurement.*
		Read:	Clemons, IT and the Changing Boundary of the Firm
		Read:	Clemons, Reddi, and Row, Move to the Middle (optional)
		Read:	Bakos and Brynjolfsson, Number of Suppliers (optional)
Session 11	M	21-Apr	**Case Study on Disruptive Technologies — The Future of Consumption in China** *What is the future of consumer behavior in China? What is the future of Chinese consumer goods? What companies are positioned to succeed and which companies are not? Where are the opportunities for Western companies?*
		Read:	Clemons, Scenarios for Higher Education Clemons, Information Technology Investments: Dealing Effectively with Strategic Uncertainty Through Scenario Analysis
		HW6:	**Scenario Analysis on Chinese Consumption**
Session 12	W	23-Apr	**Course Summary and Integration** *How do emerging technologies and emerging business models affect competition? Can new technologies create new business models that are inherently harmful? That is, can new business models create market conditions that are not self-regulating, that are not competitive, and that harm consumers? What interventions would be fair both to existing shareholders and to consumers?*
		Read:	Clemons, The Future of Competition law

OPIM 613 — Information: Strategy and Economics

Suggestions for Preparing Written Case Analyses

The following simple guidelines will help you in your written case assignments for this course:

- You are, of course, not only permitted but **actively encouraged to meet to discuss your case assignments** before class. All written exercises still must be done individually or in your work groups of two or three.
- The most important thing to remember about each exercise is that it is necessary for you to **answer the assigned questions**. In this course we are not asking you to perform a general competitive analysis, tell a captivating story, summarize the case reading, or describe the company. We are asking you to perform specific analyses, based on specific principles from economics and competitive strategy. Please be certain that your answers are responsive to the assigned questions. Likewise, please separate and number your answers to ensure that you answer each part of each question, and to help your graders when reviewing your work. Please number and place your name(s) on each page. If what you are writing does not respond directly to a specific question, it probably does not need to be written, however extra credit can be earned for especially insightful and especially terse answers.
- Next, it is critical to understand that the graders are not looking for specific key words, but they are looking for **careful strategic analyses and** for **specific supporting details**. On many questions, it is possible to reach dramatically different but equally valid conclusions about the case, depending on the assumptions you make or the data you use. Please be specific about your assumptions and your supporting data and clear about your analyses.
- **There is no maximum length acceptable and no minimum length required. Most cases can be answered in three or four pages, double-spaced**. However, longer answers are not generally better or more complete. It is preferable to have a well-articulated response that presents a single well-considered viewpoint, well defended by specific examples. This is always preferable to a lengthy unstructured summary of various points, no matter how interesting each point may be separately. Longer papers frequently mean that you have not yet decided upon your answers and have instead “written around the question” and provided multiple and contradictory responses rather than articulating a single argument.

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Learning from the Experience of Others — The Power of Pattern Recognition

Session 2 — 19 March 2014

Questions for Class Discussion
Not for Written Analysis

1. What are the principal differences between strategic uncertainty or ambiguity and strategic risk? Why are the mechanisms for managing risk better understood than the mechanisms for managing uncertainty and ambiguity?

2. Do you believe that standard paradigms like conservation of energy in physical systems or finite element analysis in structural engineering have counterparts in management?

3. Can managers be taught a set of paradigms to permit rapid diagnosis of problems and rapid recognition of solutions? Are new paradigms really needed for management education?

4. What is the importance of speed in diagnosis and recognition?

5. What is the theory of ***newly vulnerable markets*** and how is it used as the basis of designing an entry strategy for attackers in mature industries?

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Versioning and the Power of Information

Session 3— 24 March 2014

Questions for Class Discussion
Not for Written Analysis

1. Why is it necessary to enjoy a monopoly position before a firm can attempt to set a single, profit-maximizing price?

2. Why does a single profit-maximizing price result in a large consumer surplus and a large deadweight loss? That is, why are multiple prices better, both for higher producer profits and lower deadweight loss?

3. With perfect information, consumers would always choose the lower price if the same item was made available at different prices. How does this explain the existence of versioning, selling very similar items at different prices? Why is versioning, to set very different prices on very closely related items after damaging good ones, more common with information goods than with purely physical goods?

4. If a firm knew customer type (good or bad risk, expensive or inexpensive to serve, etc.) how would it use this information?

5. Why does a signal have to be expensive or difficult to send? What if consumers got a 20% reduction in their insurance for taking a 2-hour *attitude training and anger management* class? What if they got the same 20% reduction only after perfect attendance at a 12-month class with an exam after each session? What if you got a 20% reduction in health insurance costs for joining a health club for $100? What if you got the same reduction only for playing varsity hockey?

6. What is the difference between a signal and a screen? Why is the use of screening mechanisms and screening contracts in business so much more common than the use of signals?

7. Why are there complex social issues associated with information asymmetry? Why are these issues becoming more complex? Why are regulators becoming suddenly more interested in corporate use of screening contracts and data mining?

8. Why are these issues complex enough that regulators often get their analyses wrong

in subtle ways that have huge implications for the markets?

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Dealing with Information Asymmetry — Screening Mechanisms in Newly Vulnerable Markets

(Capital One Case Discussion[1])

Session 4 — 26 March 2013

Questions for Case Discussion Not for Written Analysis

1. What is the ***customer profitability gradient*** and why is it so important to modern profitability-based strategies?

2. [It seems pretty clear that the defender should **always** enjoy an **information advantage**, relative to a competitor attempting to capture its most profitable customers. That is, the attacker is making **educated guesses** about who might be profitable and who might not be; the defender, it would appear, always has more **accurate information** on who has been profitable and who has not been.] Why do some attackers encounter situations where defenders appear unable to duplicate the attackers' strategies and thus unable to defend themselves effectively?

3. [With Joseph Stiglitz's winning a Nobel Prize in economics, we now know that Capital One's strategy was based on ***screening mechanisms***, which involve the design of a contract or set of contracts that induces the customers you want to select the contract you want. Clearly, Capital One wanted the *type* of customer who paid finance charges.] What was the screening mechanism employed by Capital One to attract profitable customers?

Questions for Case Discussion And Written Analysis (Questions are continued on following page)

(4 pts) 4. Everyone wants lower interest rates. But assume that requesting the balance transfer product, in order to get lower interest rates, required significant amounts of time on the phone "on hold". (i) Who were Capital One's target customers? (ii) How did the balance transfer strategy work as a screen to get only those target customers? Why didn't the balance transfer product appeal to everyone?

(6 pts) 5. Capital One had higher costs than other credit card issuers because it did not have access to deposits or other cheap sources of funding for its credit card portfolio, it did not have operational scale, and it was attempting more complex marketing

[1] There are no power points posted in the course website for case discussion sessions.

strategies. And yet it charged lower prices, as reflected in its lower APR. (i) How can any organization have higher costs and lower prices than competitors and still be more profitable? (ii) Was Capital One's strategy designed to exploit a newly vulnerable market?

(Questions Continued on Next Page)

(4 pts) 6. [Capital One's competitors could have seen that Capital One was more profitable.] (i) Why didn't other banks copy its balance transfer product? You need to say something more interesting than "they were structured in silos" or "they couldn't figure out which customers were profitable". (ii) Why didn't other banks just embark on a strategy of targeting and stealing Capital One's best customers after they saw how well Capital One's strategy was working, and thus after they knew how desirable Capital One's customers were?

(6 pts) 7. Surely there have to be other newly vulnerable markets in some other industries! The new alternative to taxis, Uber (https://www.uber.com) provides a possible example. (1) Is there a Customer Profitability Gradient (CPG) for Uber? Why is Uber able to offer a service at rush hour, during holidays, or during bad weather, when there are not enough taxis to meet demand and how does this contribute to their CPG? (2) Why is the market for alternative transportation newly easy to enter? That is, why didn't someone try a smart-phone application like this ten years ago? (3) What makes this market difficult to defend? That is, why don't regular, regulated urban taxi services respond by adopting Uber's strategy?

(10 pts) 8. The idea of customer profitability gradients and information asymmetry should be readily extensible to other industries. (i) Is there a strong customer profitability gradient in private medical coverage, such as operating an HMO or PPO? If so, what would constitute a profitable customer? (ii) How might an unscrupulous HMO or PPO operator earn extraordinary profits through a Capital One strategy? (That is, what would a screening mechanism look like?) (iii) In the era of traditional landlines and regulated telephone service, was there a strong customer profitability gradient in telecommunications? If so, what constituted an extraordinarily profitable customer? (iv) How might an unregulated new entrant have attracted profitable customers? (That is, what would a screening mechanism look like?) (v) Is there a strong customer profitability gradient among individual consumers as customers for paper towels and detergents? If so, what constitutes a highly profitable purchase of paper towels and detergents? (vi) How might a traditional store or online retailer attract only customers willing to pay extraordinarily high prices for paper towels and detergents? (That is, what would a screening mechanism look like?)

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Hustle at a Discontinuity, followed by Platform Envelopment: Platform Envelopment and Resource-Based Sustainable Competitive Advantage

(Rosenbluth Travel Case Discussion[2])

Session 5 — 31 March 2014

Questions for Case Discussion And Written Analysis

(8 pts) 1. Rosenbluth appears to have benefitted from opportunities in travel as travel became in some sense a newly vulnerable market. (i) What event made the market for corporate travel services more attractive to travel agents than it had been? (ii) Why were there now opportunities to add value for corporate customers? (iii) Why was there now a profitability gradient in this industry? What was the profitability gradient in selling air travel? (iv) Why were airlines not able to counter Rosenbluth's moves into corporate-focused travel services? That is, why were they not able to protect themselves from Rosenbluth's attack on their ability to serve their most profitable customers?

(6 pts) 2. Rosenbluth seems to have enjoyed competitive advantage for many years. (i) Why didn't American Express or some other dominant player launch a strategy focused on corporate travelers before Rosenbluth did? (ii) In what ways did Rosenbluth clearly follow a platform envelopment strategy, with new applications interacting with older applications to create value for customers? (iii) Why was this attempt at platform envelopment successful in allowing Rosenbluth to defend its initial advantage after other small agencies saw the value of Rosenbluth's strategy?

(3 pts) 3. Rosenbluth has exited the industry, and under terms much less attractive than they would have gotten in 2000. (i) Why did airlines want to recapture control over their ticket sales? (ii) Which portions of the travel market did they target and attempt to recapture? (iii) Why were airlines able to recapture the booking of air travel; that is, what made the market for selling airline tickets newly easy for airlines to re-enter?

(3 pts) 4. And, despite all expectations, the alliance of reservations systems and their own online agencies has been surprisingly durable and surprisingly powerful. (i) Why are online agencies like Orbitz and Travelocity still relevant to leisure travelers, and thus more attractive than going to an airline's own website? (ii) Does this tell us why airlines themselves created Orbitz? (iii) Why do Orbitz and Travelocity, and

[2] There are no power points posted in the course website for case discussion sessions.

most traditional physically-based travel agencies, continue to use Sabre and Travelport?

(Questions Continued on Next Page)

(10 pts) 5. When valuing Google, we are tempted to claim their business model is unique. Almost nothing in business is unique. (i) Could we use the CRS business as a "like" when using mark to like[3] to value Google? What are the similarities? Who uses the CRS or uses Google? Who pays in each case? (ii) What are the differences between airlines search and search for everything? Which industry is larger? (iii) What other differences are relevant? Why couldn't airlines escape from the travel agent CRSs in the 1980s? Are there firms that can escape from the power of third party payer search? Are there firms that probably cannot? (iv) Does Google appear to be following a successful platform envelopment strategy? (v) Why did the FTC accept Google's argument that there are no barriers to entry in becoming a search engine, and no barriers to entry in competing with Google as a merchant, a travel agent, or a ticketing agent?

[3] Venture capitalists often use "mark to like" when valuing a new enterprise. This means they try to find a similar business, and then see how the new enterprise will differ. They start with the valuation of the similar business, and then adjust to account for differences. For a description of the use of mark to like, see http://people.stern.nyu.edu/bakos/wise/papers/wise2009-6a2_paper.pdf. For an example of mark to like applied to new technology businesses, see my Huffington post, http://www.huffingtonpost.com/eric-k-clemons/facebook-value_b_1276402.html.

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Two-Sided Markets, Platform Envelopment, and Third Party Payer Business Models

Session 6 — 2 April 2014

Questions for Class Discussion
Not for Written Analysis

1. Third party payer business models have been around for some time. The airline reservations systems model provides a good example. Travel agencies had a choice of going directly to the airlines for reservations or staying with the CRSs that they were provided; why did they use CRSs? Once customers use agencies to book flights, and agencies use CRSs to find flights, airlines are required to participate and to pay the fees that CRSs demand. Why didn't agencies object to the fees charged to airlines? Why didn't customers object?

2. American Express can also be considered a third party payer business model. The customer uses AmEx to pay for travel or for expensive impulse shopping purchases, but does not pay for the use of the card. The merchant needs the traffic brought by American Express, and pays the fee charged by AmEx. What limits the fees charged by American Express? What limits the fees that acquiring banks charge these merchants when customers use MasterCard or Visa instead?

3. So competition between numerous banks servicing merchants seems to limit the fees charged by credit card companies even in a credit card third-party payer environment, but competition between search engines does not appear to limit pricing charged by Google. Why? What is different? What is the same?

4. Groupon appears to be a third party payment business model as well. Is it?

5. Do third party payer business models represent an antitrust threat as severe and as unanticipated as natural monopolies were after the framing of the Sherman (Antitrust) Act? Natural monopolies were recognized in the late 19th century as a novel regulatory problem with railroads, and then even more obviously with telecommunications. Might third party payment mechanisms require unique regulatory treatment? If so, when?