This course covers distinctive managerial issues in the network and information industries - including the Internet, telecommunications, computing, consumer electronics, entertainment and media, online information goods, health care, financial services, and transportation. We discuss factors distinctive to these industries, and how they affect strategic interactions among firms as well as consumers’ choices of products and services. You will learn to analyze pricing strategies including versioning and bundling; product standardization decisions; managing product complements; exploiting network effects; managing systems competition; and business (revenue) models for information and network goods. Students should be comfortable with economics, data analysis and mathematical notation.

Texts:


The textbook and a custom text pack containing additional readings will be available at the UC Davis bookstore. Recommended and optional readings will be distributed on course web site.

**Pre-requisites** This course is ideally taken after completing your MBA core classes in economics (“Markets and the firm”), statistics (“Data analysis for managers”) and marketing management. Please consult with me if you have not taken these classes.
1 Overview

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Objectives

Information goods and services are a rapidly growing segment of our economic life, and include software, digitized music, video, cable entertainment, real-time information services, online transaction services etc. These products are often delivered over a communication network, and/or are associated with a virtual network - users or groups who use a compatible product. Networks - comprising physical, electronic, or virtual linkages - are fundamental to IT, online services, communication, and entertainment industries, as well as traditional sectors such as health care, banking, services, transportation and energy. Networks play a distinctive role in business decisions and strategy, oftentimes posing unique and significant problems. Common to all networks are externalities, complementarities, economies of scale and scope, compatibility, and standards. This course examines how characteristics of network and information goods affect strategic interactions among firms, and consumers’ choices of products and services. You will learn to analyze pricing strategies including versioning and bundling; product standardization decisions; managing product comple-
ments; exploiting network effects; managing systems competition; and business (revenue) models for information and network goods. The course will include numerous case studies drawn primarily but not exclusively from communication and information sectors in the economy. The course will help you understand and analyze questions such as:

1. Why do so many firms in the IT industry give away their best products free?
2. Why do online stores often exhibit product lines with long tails?
3. What might happen if the FCC forces cable companies to offer a la carte pricing?
4. Why do firms force consumers to buy bundles of goods rather than just the components they need?
5. How can a gasoline station manage to charge substantially higher price than its competitor just across the street?
6. How can software firms increase profit by damaging their own product (even when doing so increases cost)?
7. What are the implications of long-running format wars (say, between Sony Blu-Ray and Toshiba’s HDVD for the high-definition DVD format) and should technology firms be forced to adopt a common standard?
8. Why do some firms work hard to build converters to their competitors’ products while others work equally hard to obstruct such converters?
9. How can the ability to charge personalized prices (extracting more consumer surplus) be profit-reducing to the seller?
10. What factors affect the price path for IT goods – should prices increase or decrease over time?
11. Why do wireless and Internet service providers offer “all you can eat” pricing?
12. Who are the least profitable customers under flat-rate pricing and how do firms deal with them?
13. Why is software typically so defective?

Disclaimer: The syllabus design is tentative, will evolve with time, in consultation with interested students. Please communicate your inputs and suggestions to me.
Required Readings


**Further Reading:**

   
   *Provides a good and consistent mathematical foundation to analyze a variety of issues discussed in class.*

   
   *Light reading and useful insights related to course material.*

   
   *Deep and in-depth coverage of many pricing related issues in networks.*

4. The Information Economy site at UC Berkeley. [http://www2.sims.berkeley.edu/resources/infoecon/](http://www2.sims.berkeley.edu/resources/infoecon/)

5. [http://www2.sims.berkeley.edu/resources/infoecon/Networks.html](http://www2.sims.berkeley.edu/resources/infoecon/Networks.html)
2 Detailed Schedule

2.1 Session 1.

- **Course overview, Introduction to information and network goods.** Cost structures, network effects, product complements, two-sided networks, standards, compatibility, product and price differentiation. Examples of puzzling business characteristics in these industries.

- **Required Readings:** [1, Ch1; Ch2 p. 9-32], [2].

- **Assignment:** Answer any two “puzzles” listed in course syllabus, and create one question that interests you in this area.

- **Follow-up:** Form teams for group assignments and class project (3-4 members). Submit one-page sheet listing group membership and potential topics of interest for class project.


2.2 Session 2.

- **Technical review (I).** Technical review 1 - mathematical concepts, modeling demand and supply, monopoly pricing, product differentiation, versioning.

- **Required Readings:** [1, Ch2 p. 37-44; Ch2 p. 53-60], [2].

- **Case discussion:** Cambridge software - version pricing [3].

- **Preparation for class:** Review necessary material from your Economics core class.

- **Assignment:** Research one example of information and/or network good - describe its fixed costs, variable costs, versions, prices, network effects (if any, and what type), compatibility with own and competitor versions.


2.3 Session 3.

- **Pricing strategies.** Pricing strategies - bundling, multi-part tariffs, performance-based pricing.

- **Required Readings:** [1, 2].

- **Case:** Everdream - performance-based pricing, service guarantee [3].

- **Assignment:** Bundle pricing exercise: Pure vs mixed vs no bundling.


2.4 Session 4.

- **Pricing strategies.** Pricing - subscription, site licensing, sharing. Differentiation in pricing schemes.

- **Required Readings:** [1, 2]

- **Case:** Virgin Mobile - subscription vs per-use pricing [3].

- **Assignment:** Ex-ante vs ex-post pricing.


2.5 Session 5.

- **Technical review (II).** Game theory and competition; duopoly pricing and product decisions; Nash and undercut-proof equilibrium.

- **Required Readings:** [1].

- **Assignment:** Duopoly pricing, equilibrium.


2.6 Session 6.

- **Compatibility decisions and network effects.** Compatibility within own network, one-way and two-compatibility, compatibility under competition and direct network effects.

- **Required Readings:** [1, Ch 8], [2].

- **Assignment:** Compatibility decision and pricing equilibrium.


2.7 Session 7.

- **Compatibility, product complements and network effects.** Pricing and compatibility decision under product complementarities, and indirect network effects.

- **Required Readings:** [1].

- **Case:** Electronic Arts Gaming - network compatibility and alignment [2].


2.8 Session 8.

- **Two-Sided Networks.** Pricing in two-sided networks, which side to charge, balancing customer acquisition vs profitability.

- **Required Readings:** [1, 2], [3, Ch 5-6].

- **Case:** NeoPets Inc [4].


2.9 Session 9.

- **Platform Competition and Control, Standard Wars.** Winner-take-all markets, battle for standards.

- **Required Readings:** [1], [2, Ch 9].

- **Case:** Instant Messaging software - battle for the standard [3].


2.10 Session 10.

- **Course summary and recap.**

- **First set of project presentations.**
2.11 Finals week.

- Course Wrapup.
- Second set of project presentations.

3 Administrative Issues

Grading and Evaluation

Mix of (a) short assignments (to keep some continuity and to give me some feedback on students’ learning) and a mid-term exam, (b) case analysis and discussion, (c) a substantial project that applies the principles learnt in the class to (ideally) a real-world problem, and (d) class participation, which includes attendance, participation in discussions, case presentation and discussion leadership.

Class Policies and Rules

- Participation: Your presence and active participation is extremely critical to the success of the course. Please attend class, read material in advance, work out assigned exercises, and contribute actively to discussion. Not all exercises require a written submission, but bring your notes along in case you are called to present.

- Attendance: Classes will begin on time. Please try to arrive before start and remain through the session. One or two absences are permissible under certain circumstances, with automatic reduction in points for class participation and assuming a “make up” effort on your part (see below: “What to do if you miss a class?”). More than two absences are not permitted. You must attend the first and final sessions.

- All reports and written assignments should be delivered on time in hard copy form (please retain a copy) – at the beginning of the corresponding session (20% penalty for each level of delay). Reports should be easy to read (clearly legible, if handwritten), with good layout and organization into subsections, and as concise as possible. Please separate essential points and details, by moving details into an Appendix. Excessive use of color or other attempts to beautify the report are unnecessary.

- Please avoid distractions - cell phones, talking among yourselves, food, music, etc. If you have something relevant to discuss, please share with the class.

- Please report any exigencies and constraints to me as early as possible.

In addition to these, you are expected to conduct yourself according to the University of California’s standards of ethical conduct for students, in particular, the sections on academic conduct.
and integrity. Details may be obtained from the GSM Associate Dean or the Office of Judicial Affairs.

What to do if you miss a class?

In case you do miss a class session, it is your responsibility to catch up with independent readings, problem-solving, etc. But, in addition, you must also (a) obtain the essential aspects of class discussions by meeting with at least two students who attended the class, for at least 15 minutes each, and (b) document the results of all these efforts by submitting a written document summarizing the session (as a rough guideline, this will be 1-3 page write-up). This document is due by the next class session.

4 Class Project

An in-depth class project, done in teams of 2-3, will be an integral learning component of this course. The project topic is your choice, in consultation with me, and should involve application and analysis of the concepts learnt in this class to a real-world problem. Project work should adhere to the following timeline and deliverables.

April 15 Project proposal - list the topic and describe the intended final output. Half to 1 page.
   Email this to me, and follow up with a phone or F2F discussion during the week.

May 13 Progress report and remaining work plan. 2 pages.

June 3 Project presentation to class (but you can imagine the audience is your corporate executives or board etc.). Written report is an executive summary (approximately 3-5 pages) supported by additional materials from your presentation.

Some possible project categories are described below. In both cases, the context should be one where concepts distinctive to network and IT industries (e.g., network externalities, standards wars) are crucial aspects of the problem.

4.1 Qualitative Analysis of Competitive Strategy

Write an essay analyzing crucial competitive actions over the last 5-15 years, pursued by a family of firms/products.

1. State the background facts, describe what competitive factors are at play (e.g., strong network effects), the key milestones in competitive strategies and actions chosen by the firms (e.g., compatibility choices).
2. Analyze whether these actions were smart or not, did they suitably take into account the competitive factors listed above, what were the outcomes, and to what extent are they consistent with theory (and therefore could have been reasonably predicted).

3. Conclude with some lessons learnt and suggestions/directions for management decisions in other industries.

4.2 Quantitative Analysis for Decision Support

1. Identify a business decision problem, describe relevant data and competitive factors for making the decision, identify the space of decision alternatives, and perform some quantitative analysis to understand the performance of different alternatives.

2. The results need not be numerical, operational details (because you may not have complete data, or considered every single detail relevant to the decision), rather they could be general and robust strategic insights, e.g., maintain a very low price (by giving massive discounts or other incentives) until you get a 20% market share or competitor X exits the market, then gradually start increasing price.

4.3 Analysis of Interesting Phenomenon in IT Industry

Identify a phenomenon of interest (e.g., long-tail effect, free products, pricing strategy) in a specific industry sector or a set of products. Collect and analyze some data corresponding to this phenomenon, in order to understand whether (or to what extent) that phenomenon is at play. Discuss (a) what you observe (i.e., what the data tell) and (b) whether the observations are consistent with theory (i.e., why you should/should not expect to see this happen). Ideally the analysis should involve striking a contrast with a second set of products/examples where these observations should not be expected to happen.