A new industry sector of “network” and “information” goods has become prominent in our society in the last two decades, and includes hardware, software, online information goods, Internet and telecommunications services, consumer electronics, entertainment and media products. Competition in these industries is driven by peculiarities, e.g., in their cost structures and in the dominant role of network effects. Network effects - involving physical, electronic, or virtual linkages - are fundamental to information technology goods, but are also crucial in traditional sectors such as health care, banking, services, biotechnology, transportation and energy. Networks play a distinctive role in business decisions and strategy, oftentimes posing unique and significant problems involving product complementarities, compatibility, and standards; many network goods also serve as platforms that enable two distinct user groups to interact.

This course helps you understand the characteristics of these industries and how they affect strategic interactions among firms and consumers. For example: Why do firms in the IT industry give away their best products free? Why is software typically so defective? How can a gasoline station manage to charge substantially higher price than an identical one just across the street? Why do makers of video gaming consoles subsidize end users (but tax game developers) while computer operating system makers subsidize software developers (but overcharge end users)? How should you price a new technology that is far costlier to make but delivers higher lifetime value to the buyer? Why did Sony win the Blu-Ray format war against HD-DVD which was sponsored by a whole array of companies? The course examines questions such as these through a combination of simple but rigorous analytical models, emerging theories, and plenty of real-world examples, experiences, and formal cases.
Texts:


Additional readings are distributed through study.net.

**Pre-requisites**  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.

**Disclaimer:**  Syllabus is tentative. Final design will depend on class size, availability of guest speakers, and scheduling flexibility. Number of cases discussed in class may vary in each section. Assignments will be handed out at least one week in advance.

**Pedagogical paradigm**  The course will be a mix of lectures, classroom discussions (usually around business cases), and guest speakers. Some concepts are rigorously examined through mathematical models covering consumer and firm behavior, and competitive actions. These concepts are also illustrated via highly simplified models and numerical computation. Source code for numerical computation will be made available for the students to play around, change parameters, examine sensitivity, and so on. To make use of it, you will need to download and install a copy of the open-source computing environment called ‘R’ (see http://www.r-project.org/). You are also welcome to encode the same models in Excel or some other computing environment.
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1 Overview

1.1 Objectives

You will learn about the characteristic features of network and information goods (and related products), their distinctive impact on competitive strategies in these industries, and how to manage them. Topics covered include pricing strategies such as versioning and bundling; product standardization decisions; managing product complements; 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. Why do many software makers and cable TV operators force consumers to buy bundles of goods rather than just the components they need?
4. What might happen if the FCC forces cable companies to offer a la carte pricing?
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. How can the ability to charge personalized prices (extracting more consumer surplus) be profit-reducing to the seller?
8. What factors affect the price path for IT goods –should prices increase or decrease over time?
9. How should you price a new technology that is far costlier to make than the existing alternative, but delivers higher lifetime value to the buyer?
10. Why do wireless and Internet service providers offer “all you can eat” pricing?
11. Why do cell phone service providers require customers to sign contracts for long durations where they are uncertain about demand?
12. Why do some cell phone service providers let customers choose their plan tier after the end of the month?
13. Who are the least profitable customers under flat-rate pricing and how do firms deal with them?
14. Why do some firms work hard to build converters to their competitors’ products while others work equally hard to obstruct such converters?

15. What justifies “ladies nights” at nightclubs?

16. Why are there so many match-making sites within the same genre (given that participants might be best off under a “single marketplace”)?

17. Why do makers of video gaming consoles subsidize end users (but tax game developers) while computer operating system makers subsidize software developers (but overcharge end users)?

18. Why did Sony win the Blu-Ray format war against a format (HD-DVD) that was sponsored by a whole array of companies?

19. Why is software typically so defective that it needs to be fixed a few times a week?

1.2 Reading List

The required – and optional – readings for each Session are listed in the “Detailed Schedule” for that session (Section 2). You should review the Required Readings before class; the Optional readings are designed to either provide advanced concepts or to

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 and Network Economics (at UC Berkeley): lots of pointers to research resources http://www2.sims.berkeley.edu/resources/infoecon/Networks.html and data http://www2.sims.berkeley.edu/resources/infoecon/.
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 [SV98, Ch1; Ch2 p. 9-32], [Eis07].

- To prepare for class: Do Assignment 1 (Information and network goods).


2.2 Session 2.

- Technical review (I). Modeling demand and supply, monopoly pricing, price discrimination [Dhe93].

- Pricing information goods. Characteristics of information goods, and how they affect product differentiation, price discrimination, versioning [SV98, Ch. 2 p. 37-44; Ch. 3].

- To prepare for class: Review concepts from 202A core class, do Assignment 2 (Price Computation).


- After-class Deliverable: 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.

Optional Reading


2.3 Session 3.

- **Case discussion**: Cambridge software - multi-version pricing [Dhe93].

- **Product bundling** [OS00].

- **To prepare for class**: Do Assignment 3 (Bundling).


**Optional Reading**


2.4 Session 4.

- **Strategies for Internet and Telecommunication Services**. Price discrimination via multi-part tariffs, Sale timing (advance vs. late selling) when buyers have uncertain valuations [SX00].

- **To prepare for class**: Do Assignment 4 (Advance vs late selling).


**Optional Reading**


2.5 Session 5.

- **Case**: Virgin Mobile - subscription vs per-use pricing [McG03].
- **Strategies for Software Goods**: Subscription pricing, site licensing, software sharing [Var00], timing of release and upgrades, damaged goods, managing buyer disbelief about product quality.
- **To prepare for class**: Do Assignment 5 (tba).
- **Guest speaker**: Andreas Vogel (SAP).


Optional Reading


2.6 Session 6.

- **Strategies for Two-Sided Networks**: Pricing under network effects, determining which side to charge [EPvA06], balancing customer acquisition vs profitability.
- **Game theory and competition**: Competitive duopoly pricing and product decisions; Nash and undercut-proof equilibrium [OGY06], switching costs and lock-in [SV98, Ch. 5-6].
- **To prepare for class**: Do Assignment 6 (Competitive Equilibrium in prices).


2.7 Session 7.

- **Case**: NeoPets Inc [EK03].

- **Networks Externalities**. Markets/products as networks, positive feedback, adoption dynamics for network goods, compatibility, openness, control [SV98, Ch 7].

- **Compatibility decisions and network effects**. Compatibility within own network, one-way and two-compatibility, compatibility under competition and direct network effects [SV98, Ch 8].


**Optional Reading**


2.8 Session 8.

- **Compatibility, product complements and network effects**. Pricing and compatibility decision under product complementarities, and indirect network effects. [EV06].


- **Guest speaker**: Bassel Ojjeh, Yahoo!, Vice President, Strategic Data Solutions group.

2.9 Session 9.

- **Case**: Electronic Arts Gaming - network compatibility and alignment [EW04].

- **Platform Competition and Control, Standard Wars**. Winner-take-all markets [Eis07], battle for standards [SV98, Ch 9].

- **To prepare for class**: 

2.10 Session 10.

- Course summary and recap.
- First set of project presentations.

2.11 Finals week.

- Course Wrapup.
- Second set of project presentations.