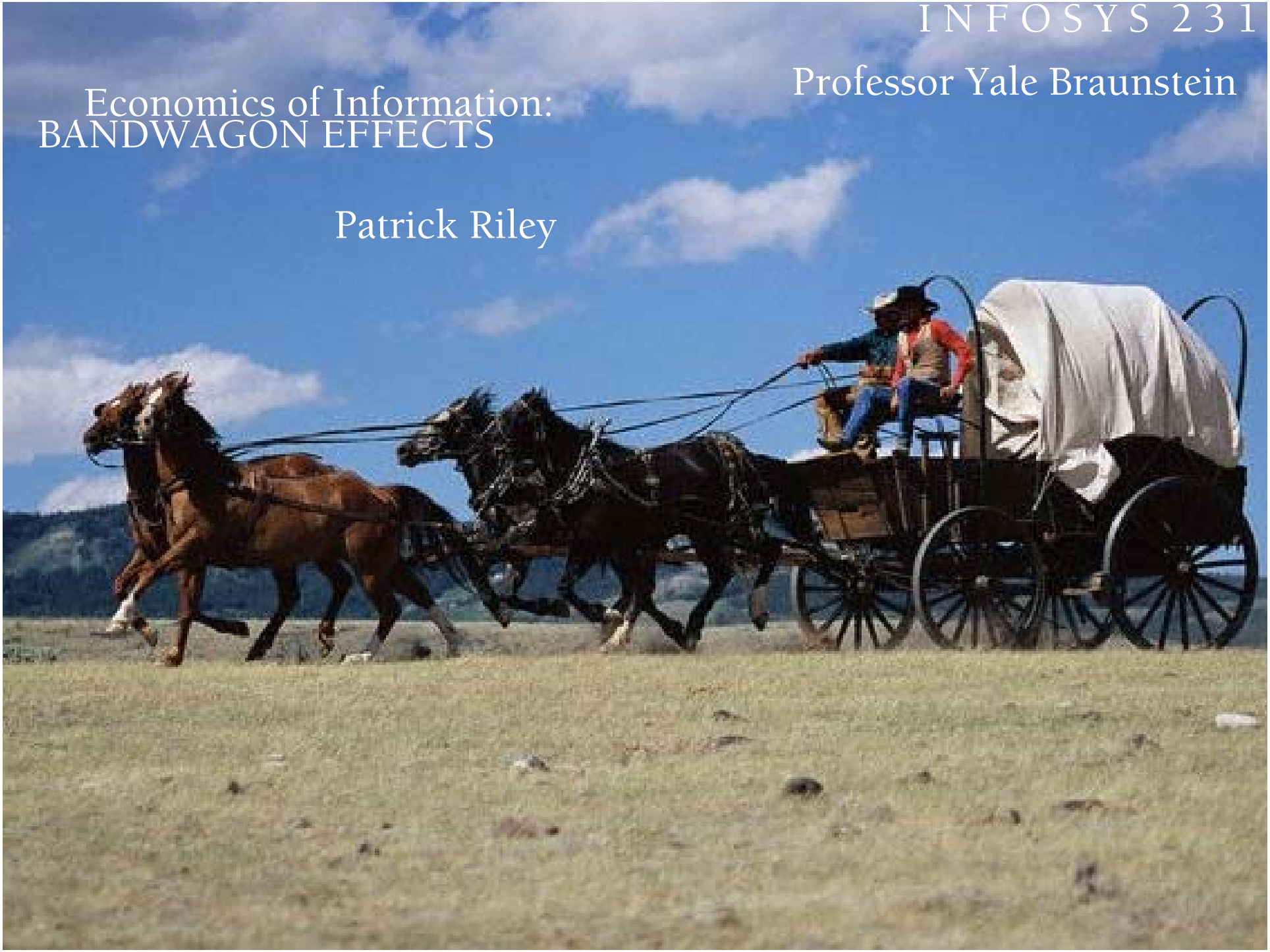
INFOSYS 231

Professor Yale Braunstein

Economics of Information: BANDWAGON EFFECTS

Patrick Riley



Economics of Information:
BANDWAGON EFFECTS

History

Harvey Leibenstein, 1950

H. Leibenstein, "Bandwagon, Snob, and Veblen Effects in the Theory of Consumers' Demand," *The Quarterly Journal of Economics* (May 1950), reprinted in W. Breit and H.M. Hochman, *Readings in Microeconomics*, Second Edition (New York: Holt, Rinehart and Winston, Inc., 1971), pp. 115-116

> "the extent to which the demand for a commodity is increased due to the fact that others are also consuming the same commodity. It represents the desire of people to purchase a commodity in order to get into 'the swim of things'; in order to conform with the people they wish to be associated with; in order to be fashionable or stylish; or, in order to appear to be 'one of the boys.'"

Economics of Information:
BANDWAGON EFFECTS

History

Jeffrey H. Rohlfs, 1974

J. Rohlfs, "A Theory of Interdependent Demand for a Communications Service," *Bell Journal of Economics and Management Science* (Spring 1974), p. 16.

> "The utility that a subscriber derives from a communications service increases as others join the system. This is a classic case of external economies in consumption and has fundamental importance for the economic analysis of the communications industry."

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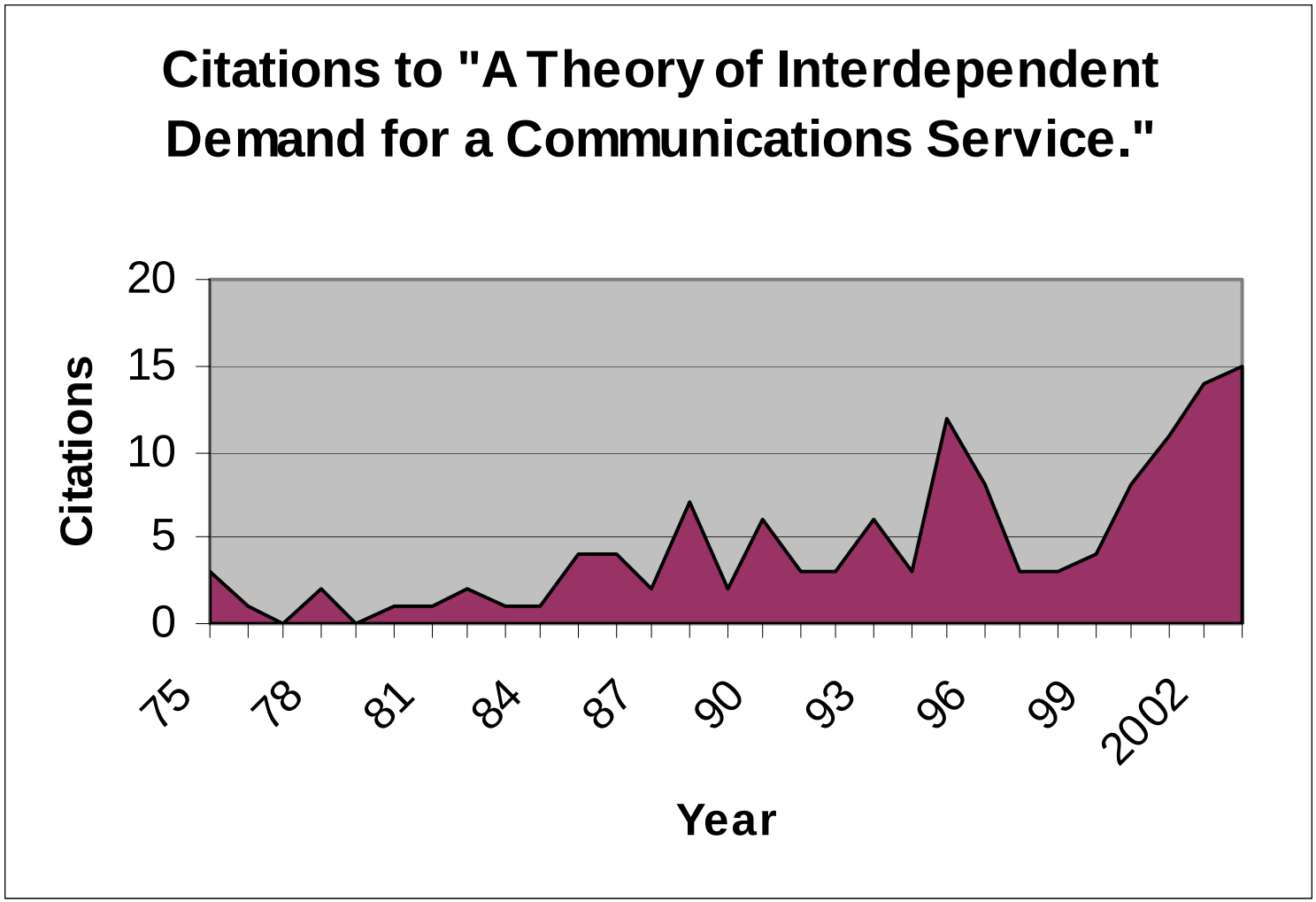
History



Economics of Information: BANDWAGON EFFECTS

The Fax

Bandwagon effect:

A benefit that a person enjoys as others do the same thing that he or she does. In particular, a consumer may enjoy bandwagon effects as others consume the same product or service that he or she does.

Bandwagon effects in high tech industries often have a basis that goes beyond what is in the consumer's head. In particular:

1) Network externalities:

The benefit from being able to communicate with additional individuals who have also become users of the product or service (these apply to products and services that use telecommunications networks.) (Example: the fax machine)

External demand-side scale economics:

Benefits that accrue to consumers as the user set expands. They are ***external*** to a single user, because the benefits to him or her derive from actions of others.

Economics of Information: BANDWAGON EFFECTS

The VCR

Bandwagon effect:

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Bandwagon effects in high tech industries often have a basis that goes beyond what is in the consumer's head. In particular:

2) Complementary bandwagon effects:

These apply to products whose value derives, at least in part, from use of competitively supplied complementary products

Economics of Information: BANDWAGON EFFECTS

Beta v. VHS

"In my opinion, the Sony-developed Beta format is superior to VHS in several ways, including better cassette design, superior tape handling, and overall better video engineering."

-Video expert, Columnist of the journal "Video"

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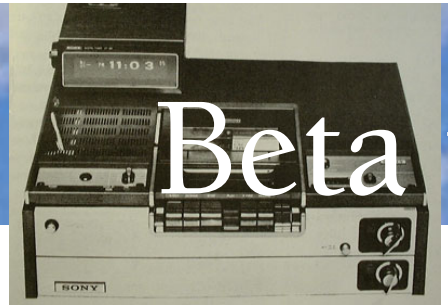

Beta v. VHS

July 1974

Sony holds demo of first working Beta prototype; meanwhile, JVC develops competitive VHS format

February 1976

Sony introduces SL-7200 deck at $1260, with optional timer for $40.

June 1977

JVC introduces the HR-3300 in the U.S. for $1,100.

September 1974

Sony meets with Matsushita and JVC and tries to convince them to adopt Betamax format; neither firm tells Sony about VHS, still in development.

April 1976

JVC demos VHS prototype to Sony in Japan. Sony refuses to compromise, calls VHS a "copy" of Beta, differing only in use of a bigger cassette.

Betamax VHS

Beta v. VHS

Betamax

Information:
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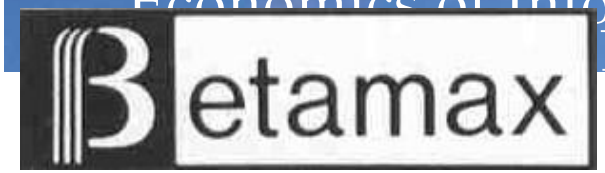
1 hour	2 hours	3 hours	4.5 hours	8 hours
1975	**1977**	**1978**	**1979**	**1982**

1976	**1977**	**1979**
2 hours (JVC)	4 hours (Matsushita)	6 hours (Matsushita) 6 hours (JVC)

VHS

Economics of Information: Beta v. VHS



Wireless remote*
½ speed machine*

1977

Portable VCR

1978

1/3 speed machine*

Scan/Slow/Still*

1979

Stereo recording

1980

Hi-Fi*
One-unit camera recorder*

1983

1977
Wireless remote
½ speed machine

1978
Slow/Still*
Portable VCR*

1979
1/3 speed machine

Stereo recording*

1980
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Scan/Slow/Still

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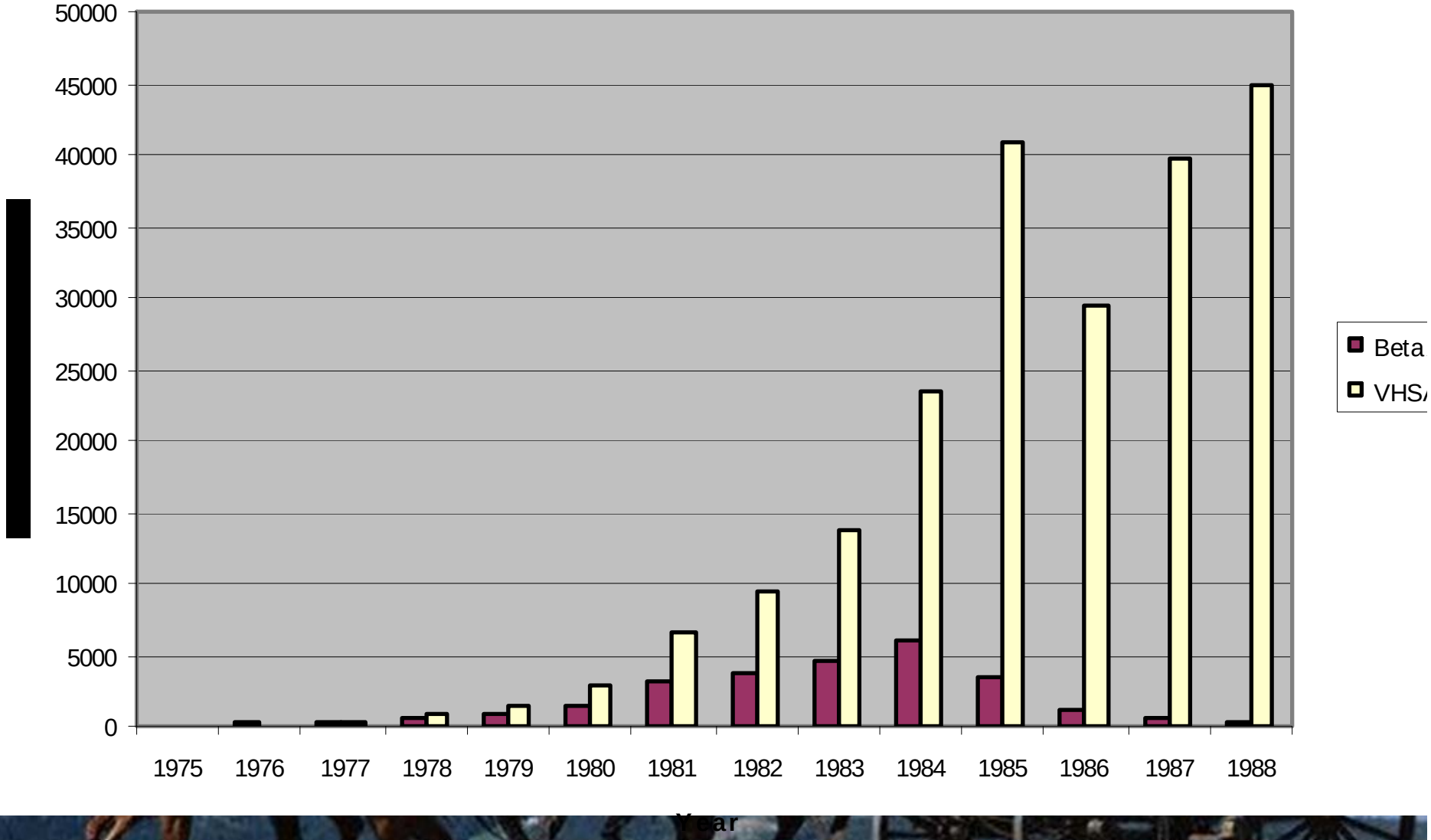
1983
One-unit camera recorder

Economics of Information: BANDWAGON EFFECTS

Beta v. VHS



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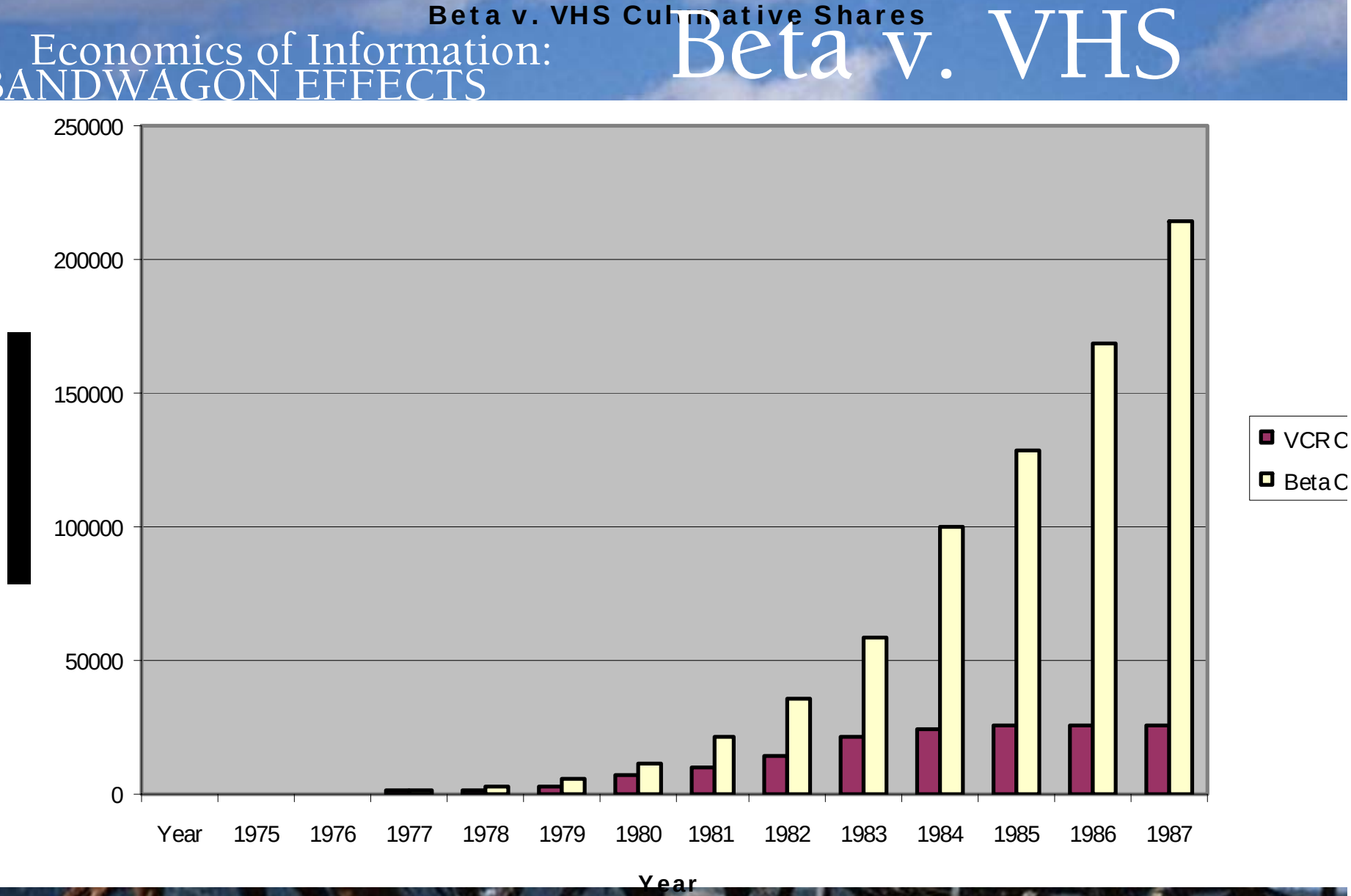
Beta v. VHS



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Beta v. VHS

- Andre Blay, a video-equipment entrepreneur in Farmington, Michigan appreciated the potential of the VCR, and knew of Hollywood's opposition to it.
- Blay wrote letters to all the Hollywood studios except Universal… Fox responded by licensing 50 movies to Blay
- Late 1970's, pre-recorded tapes started hitting the market
- George Atkinson, an entrepreneur from Los Angeles, began to rent videocassettes.

Economics of Information:
BANDWAGON EFFECTS

Beta v. VHS

- As long as the two technical standards existed, videocassette rental stores had to maintain inventories in both formats
- Consumers of each format then had fewer titles from which to choose
- Some rental stores started to go with VHS, as they had a competitive incentive to maintain a larger inventory
- As the VHS market share grew, Beta had an ever-greater disadvantage in the market
- By 1986, VHS tape revenues exceeded box office revenues, and Beta has started to disappear from the market.

Economics of Information:
BANDWAGON EFFECTS

More definitions

Demand-based equilibrium user set:

The equilibrium user set that results from demand adjustment, starting from the initial user set.

Internal demand-side scale economics:

Benefits to a user organization that increase more than proportionally as its total consumption of a product increases. The benefits are internal, because they accrue to the user organization that increases its consumption.

Initial user set:

Those who consume a bandwagon product when it is new– that is, before the user set grows and generates bandwagon benefits.

Maximum equilibrium user set:

The largest user set that is an equilibrium

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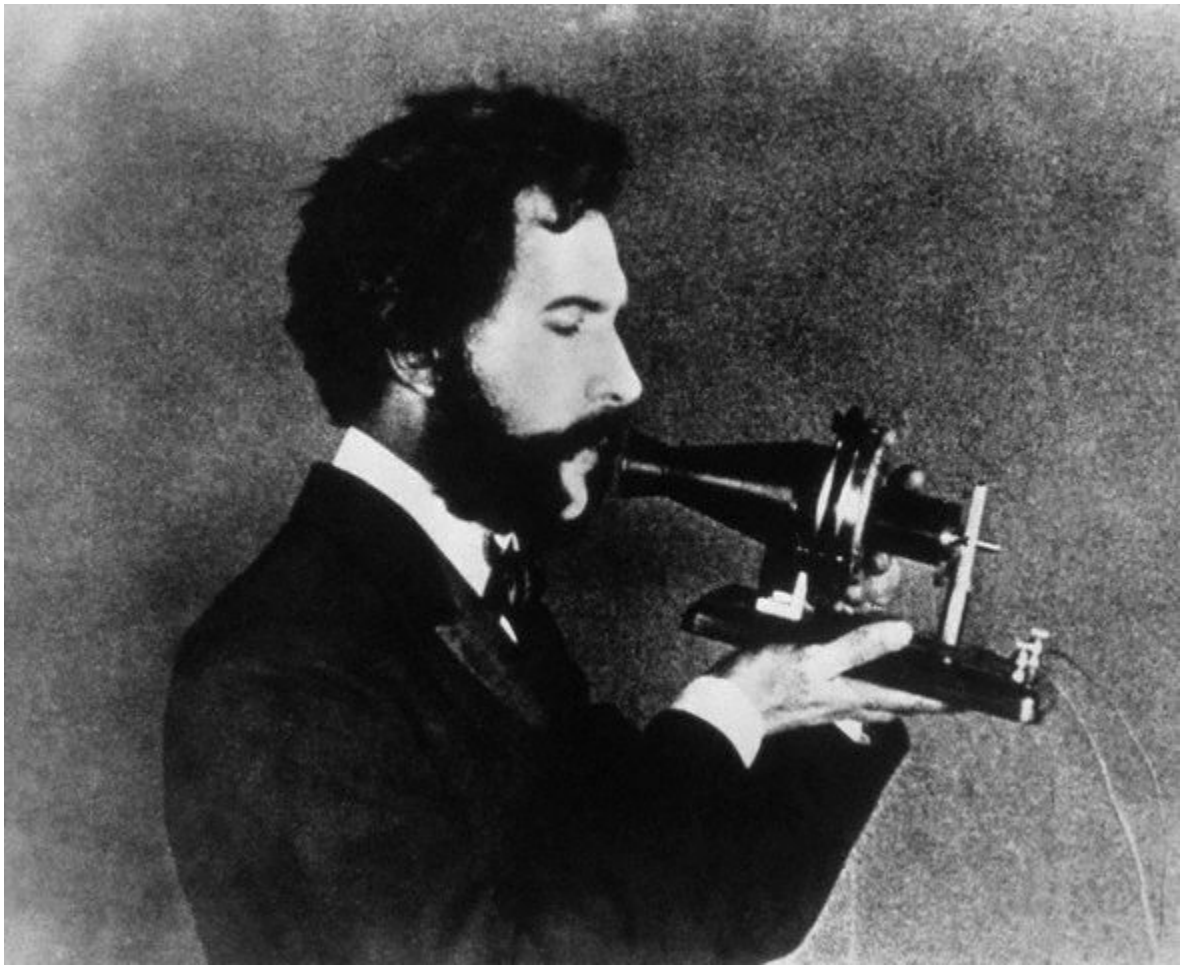
BANDWAGON EFFECTS

The Telephone



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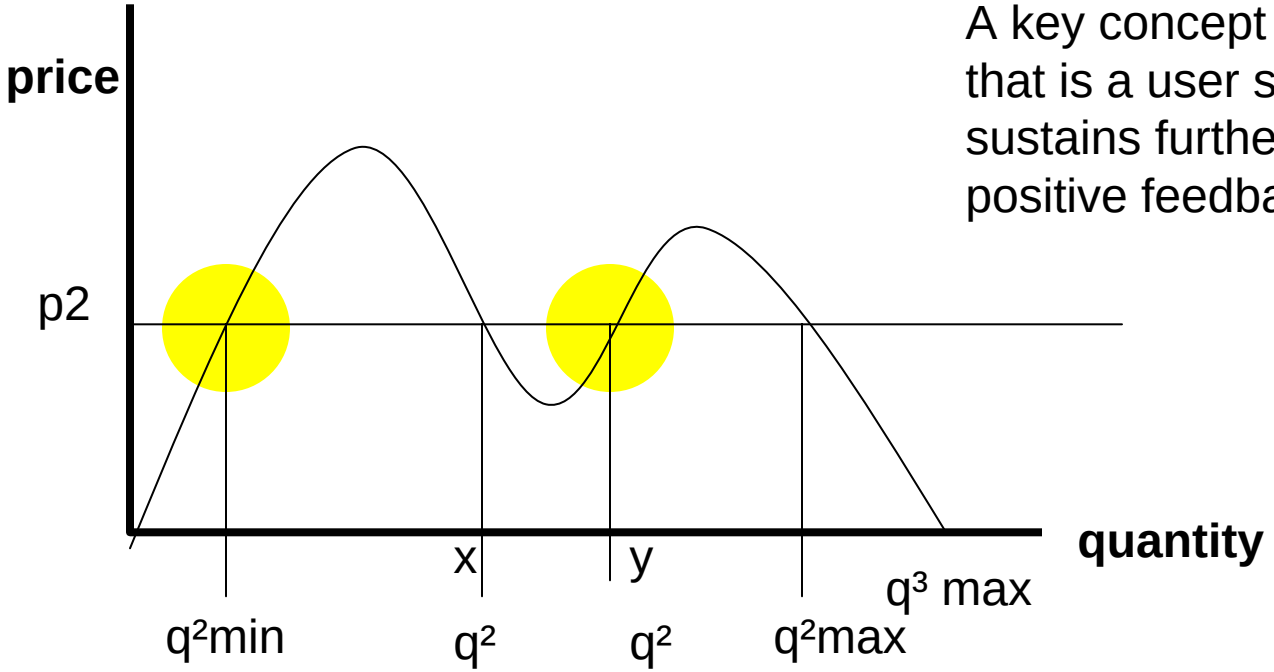
The Telephone

Critical Mass:

A key concept in demand theory that is a user set, if surpassed, sustains further growth (via positive feedback)



In this complex equilibrium of demand and price, where is a critical mass. Nevertheless, if that critical mass is achieved, demand does not increase to the equilibrium user set.

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The Telephone

Interlinking:

Interlinking is achieved by interconnection of the networks of all suppliers in an effect to provide compatibility

Positive feedback:

A process in which increases in an activity lead to further increases in that activity, which lead to still further increases, and so forth.

Interconnection:

The ability of users of one network to communicate with users of another network. Interconnection is a form of interlinking.

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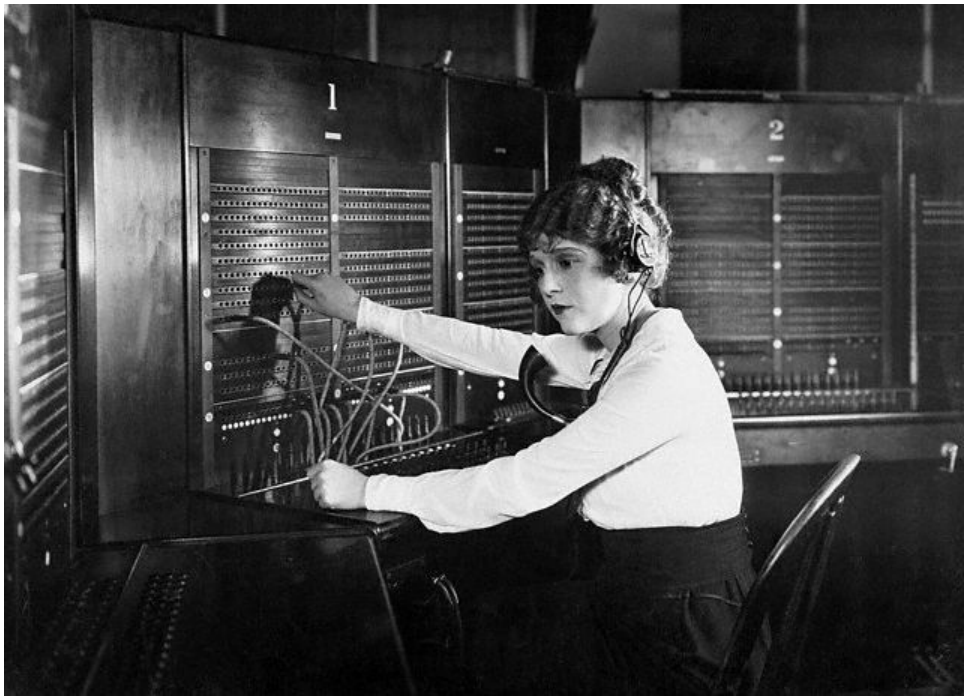
The Telephone

"…reach out and crush someone." -Department of Justice press statement.



-Bell should have had an insurmountable competitive advantage due to his relentless enforcement of patents

-advantage was squandered through high prices and slow development

-Much competition (especially from non-Bells) forced Bell to lower his price even though they weren't competing (they targeted new geographic areas)

-New lower price leads to expansion of the user set and increased bandwagon effects for consumers.

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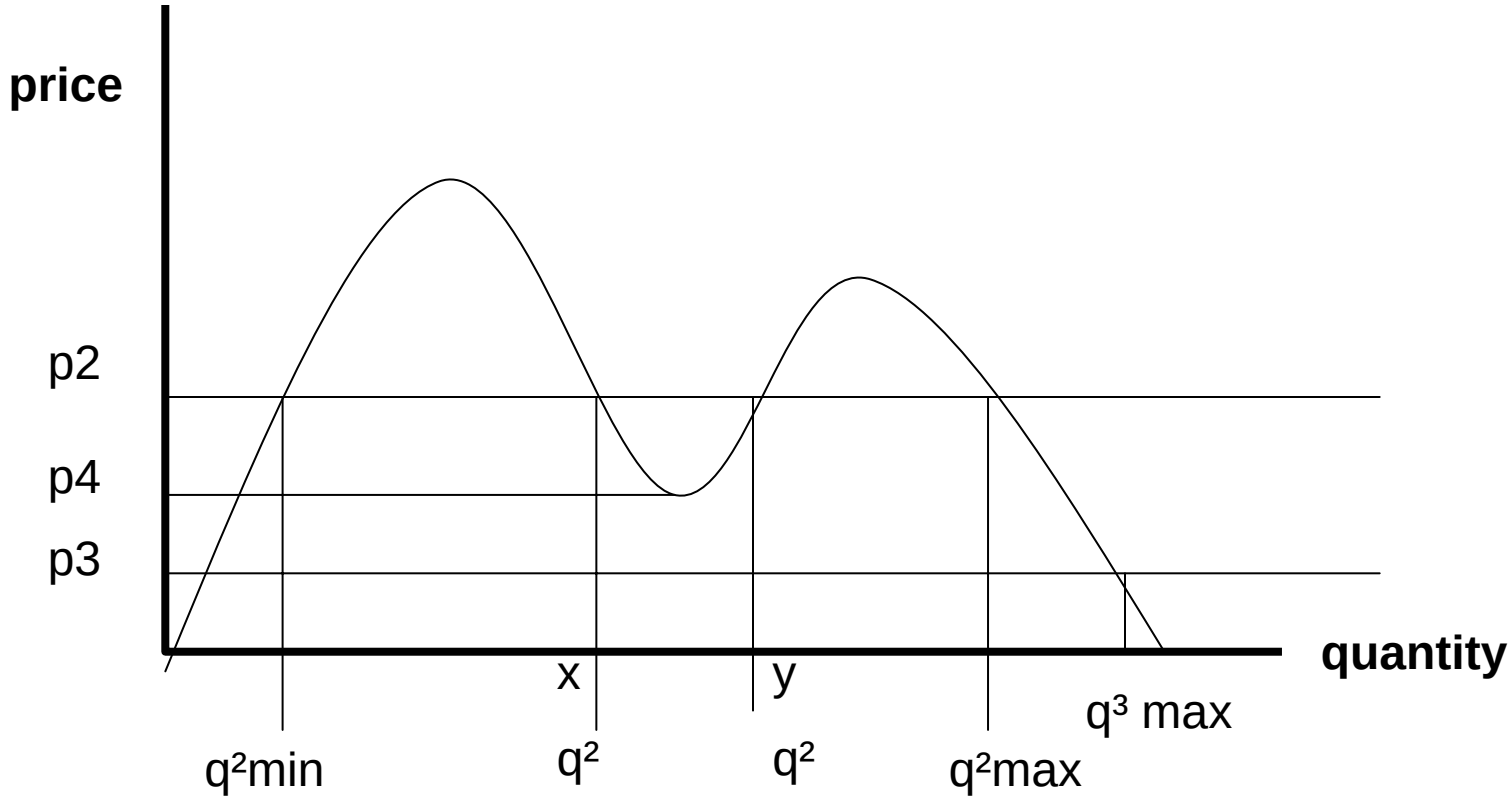
The Telephone



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Economic Incentives for Interlinking

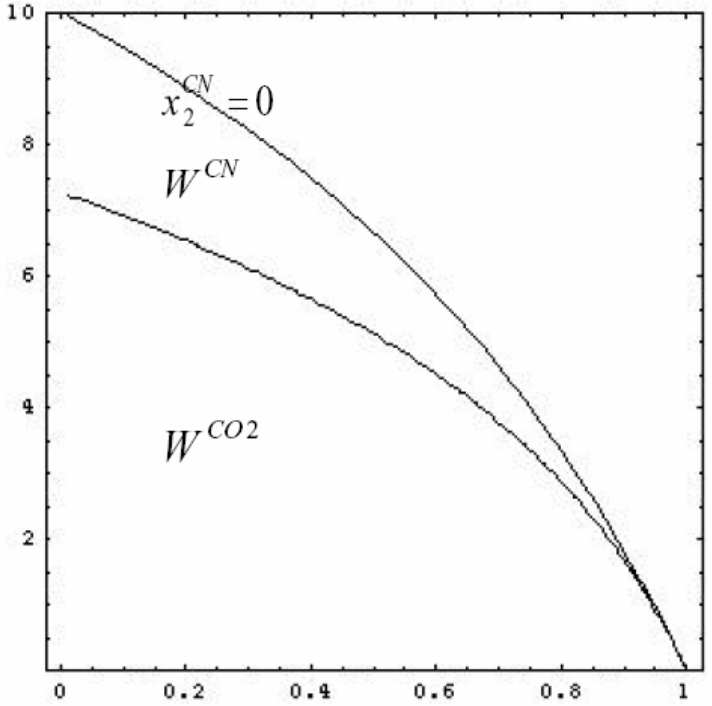
$$\Pi_1^{CT} \geq \Pi_1^{CO2} \Leftrightarrow c \leq \frac{A}{2-k} \Leftrightarrow x_2^{CO2} \geq 0 \text{ and } x_2^{CT} \geq 0$$

$$\Pi_1^{CO1} \geq \Pi_1^{CN} \Leftrightarrow c \leq \frac{(1-k)A}{2-k} \Leftrightarrow x_2^{CO1} \geq 0 \text{ and } x_2^{CN} \geq 0$$

$$\Pi_2^{CT} \geq \Pi_2^{CO1} \Leftrightarrow c \leq \frac{A}{1-k} \Leftarrow x_2^{CT} \geq 0 \text{ and } x_2^{CO1} \geq 0$$

$$\Pi_2^{CO2} \geq \Pi_2^{CN} \Leftrightarrow c \geq -(1-k)A \Leftarrow x_2^{CN} \geq 0 \text{ and } x_2^{CO2} \geq 0$$

Fig. 6: $W^{CO2} \geq W^{CN}$ (given A=20)



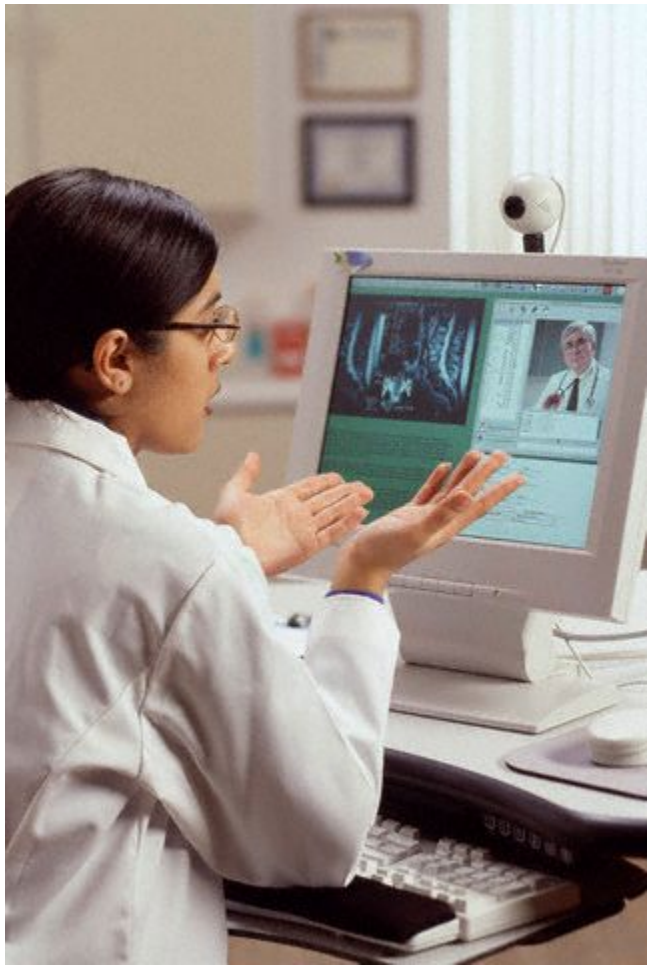
		Firm 2: Interlink	Firm 2: Not Interlink
Firm 1	Interlink	Π_1^{CT}, Π_2^{CT}	Π_1^{CO1}, Π_2^{CO1}
	Not Interlink	Π_1^{CO2}, Π_2^{CO2}	Π_1^{CN}, Π_2^{CN}

Economics of Information: BANDWAGON EFFECTS The Picturephone

"Picturephone was a loser--it never achieved critical mass and market success. No one seems to care why a loser lost-- they only care why a winner wins."

-Hal Varian

Economics of Information: BANDWAGON EFFECTS
The Picturephone



-early 1970s, Bell systems thought that the time had come for the Picturephone.

-service offered for $86.50 per month, which included ½ hour of free usage.

-never really solved “why should I pay $86.50 per month given that I would have virtually no one to call?”

-modern attempted at trying the potential bandwagon Picturephone are done by selling pairs of units, but most still do not solve the start up problem and require users to plug in Picturephones to computers or TVs.

-What will happen with the Picturephone?

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The PC

"The blunders are all there, waiting to be made."

-Chess grandmaster Bogoljubov

Economics of Information: BANDWAGON EFFECTS

The PC

"Our stuff is insanely better, we have better stuff." -Jobs

"You still don't get it…. it doesn't matter." -Gates

Following the first release of Windows 1.0 with NEC, Steve Jobs confronts Bill Gates about the replication in 1985. Jobs is later heard by Apple employees breaking plates and items in his office once Gates leaves.

-an apparent side effect of Apple's end-to-end philosophy is that consumers get insufficient choice of features and options
-Apple should have opted for an intermidate policy between IBM's complete reliance on outside supplier and the full closed architecture that Apple actually chose.

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The history of the PCs illustrates the tendency of bandwagon markets without interlinking to gravitate toward a single supplier.

Microsoft and Intel have a great competitive advantage over their rivals because they can offer their customers bandwagon effects from a huge user set. They have skillfully exploited bandwagon effects to maintain their dominant market shares for over twenty years.

Compatibility:

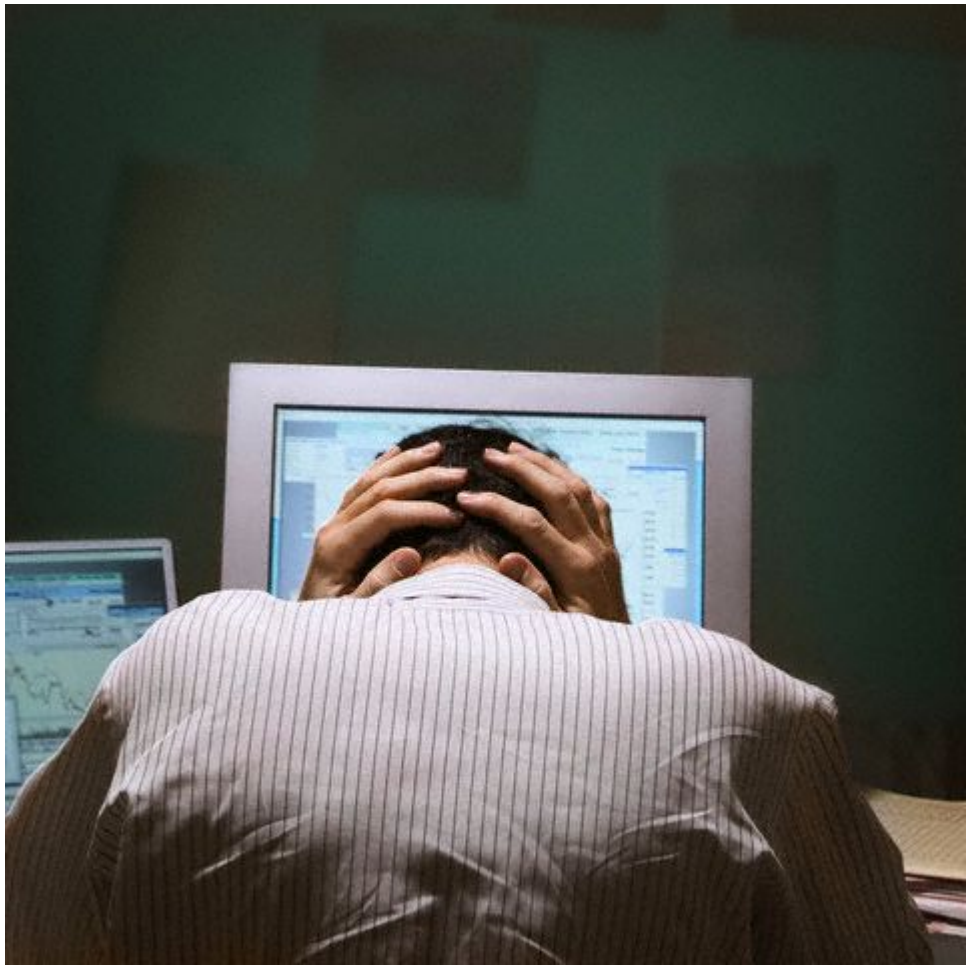
The ability of the base products of all suppliers to work in conjunction with the same complementary products. (Compatibility causes the base products to be interlinked.)

Technical standards:

An agreed-upon standard that interlinks the products of all suppliers and can be set through company and/or industry agreement, or through government intervention.

The PC

Economics of Information: BANDWAGON EFFECTS



-Will Apple ever have a chance to catch up? Why or why not? What keeps people from making the switch?

-Other examples in the PC industry?

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"The monkeys were green, the bananas were blue, and everyone had a good laugh." -David Sanoff

"Any black-and-white receiver in the New York area which happened to be tuned to Channel 2 produced either sixteen little black-and-white pictures moving rapidly upward in unison or a batch of hash depending on the particular model of receiver." (B&W CBS viewers couldn't watch the station when they were broadcasting in color.)

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HDTV

"Why did any nation (or, for that matter, any company) bother sinking so much effort into a technology that seems to hold so little commercial prospect?"

-Farrell and Shapiro (economists)

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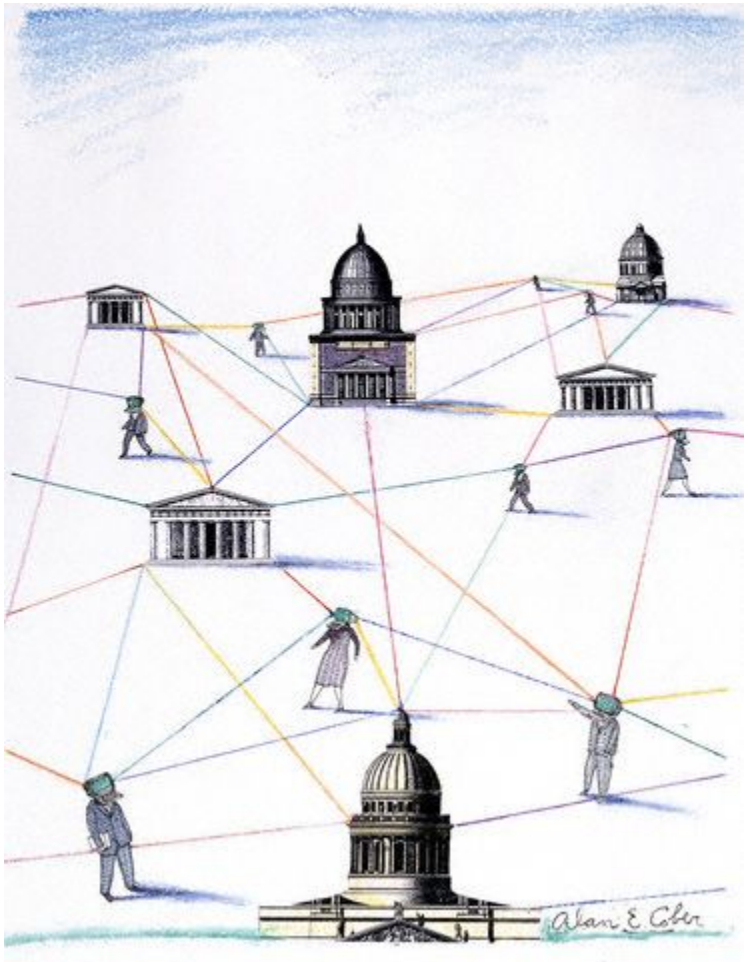
Internet



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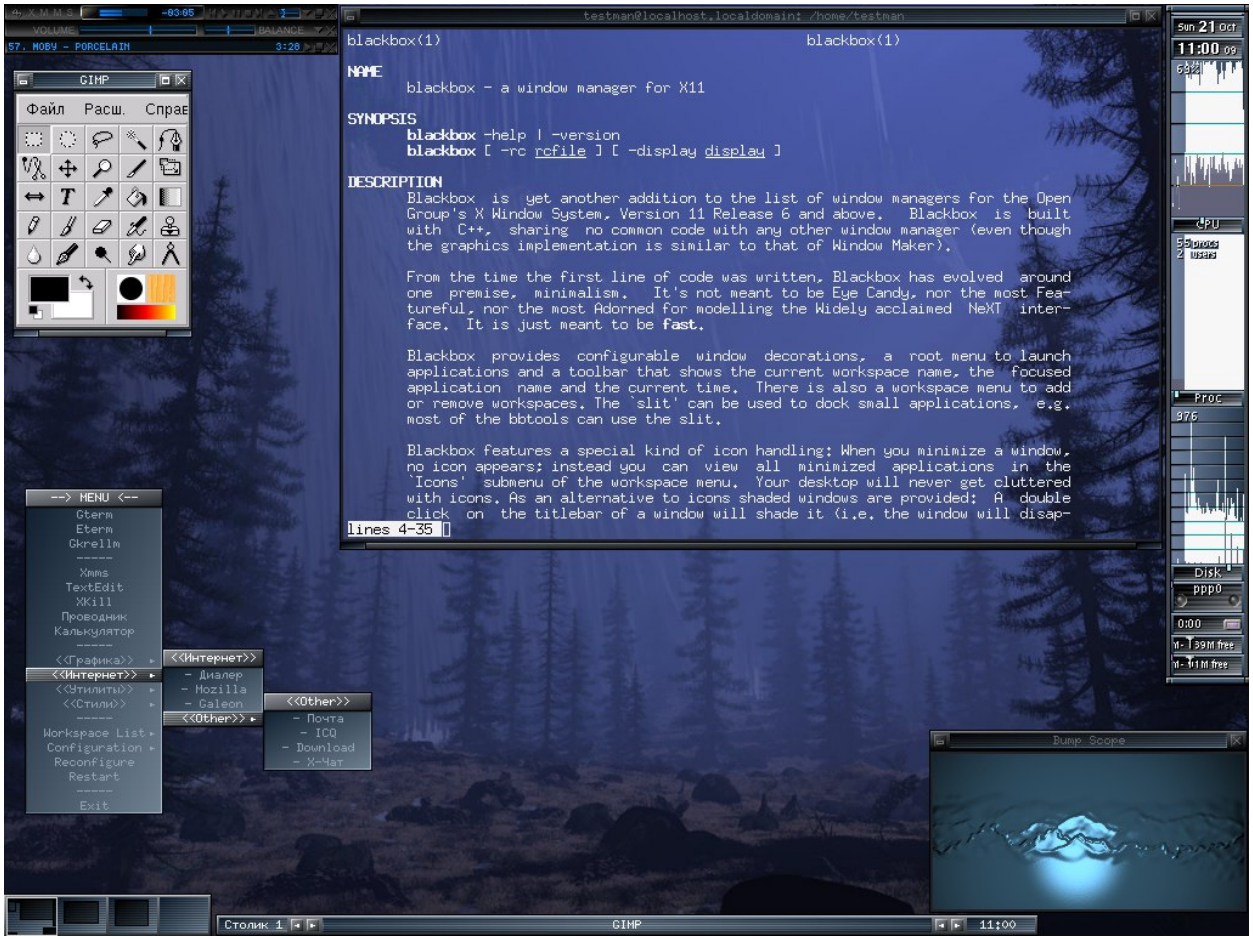
Linux GUI?



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RFIDs?