

EECS 498 System Design of a Search Engine

Winter 2026

Lecture 24: Intellectual Property and Marketing

Nicole Hamilton

[https://web.eecs.umich.edu/~nham/
nham@umich.edu](https://web.eecs.umich.edu/~nham/nham@umich.edu)

agenda

1. details
2. intellectual property
3. marketing

agenda

1. details
2. intellectual property
3. marketing

details

1. I have posted guidance on your presentations to Canvas in the Files > Assignments folder.
2. Tell me when you'd like to present at Edstem #142.
3. W25 final exam solutions posted to Canvas in Files > Exams > Final folder.
4. I am working on guidance for your final reports.
5. Course evals have opened and stay open until Wed Apr 22.
6. Peer eval forms posted to Canvas, due Tue Apr 21.

remaining schedule

1. Today: Dealer's choice: Intellectual property and marketing
2. Tue April 14: Review for the final
3. Thu April 17, Fri April 18, Tue April 21: Presentations
4. Tues Apr 21: Peer evals, final reports and project archive due
5. Wed April 22 through Wed April 29: Team debriefs
6. Wed April 29 4:00pm: Optional final exam, Dow 1013 and 1206.

agenda

1. details
2. intellectual property
3. marketing

intellectual property

Defined as valuable intangible property owned by persons or companies.

Intangible means you can't point to it. It's distinct from physical property like land, machines, or jewelry.

TABLE 10.3 Comparison of physical and intellectual property.

Factor	Physical property	Intellectual property
Multiuse	Use by one firm precludes simultaneous use by another	Use by one firm does not prevent unauthorized use by another
Physical depreciation	Depreciates, wears out	Does not wear out
Protection and enforcement from encroachment	Generally can enforce and protect ownership	May be difficult or expensive to enforce and protect ownership

key concepts

Trade secrets

Patents

Trademarks

Copyrights

key concepts

Trade secrets

A **trade secret** is a confidential intellectual asset that is maintained as secret by the owner and provides a competitive advantage.

Patents

Trademarks

Copyrights

Lifetime is potentially indefinite. Formula for Coca-Cola is over a 100 years old.

key concepts

Trade secrets

Patents

Trademarks

Copyrights

Risks:

Employees may learn the information and then leave, possibly to start a competitor.

The information could also be stolen or independently invented.

Responses:

Non-disclosure and employment agreements.

key concepts

Trade secrets

Patents

Trademarks

Copyrights

A **patent** grants the inventor the right to exclude others from making, using or selling their invention for a limited time in return for public disclosure.

In the US, patent lifetime is 20 years from date of filing.

key concepts

Trade secrets

Patents

Trademarks

Copyrights

A patent may protect:

New and useful machines

Manufactured products

Industrial processes

New chemical compounds

Foods

Medicines

key concepts

Trade secrets

Patents

Trademarks

Copyrights

Types of patents:

1. **Utility patents:** new, useful, *non-obvious* processes, machines and manufactured products.
2. **Design patents:** new, original, ornamental and *non-obvious* manufactured items, e.g., Steve Jobs's staircase, Macintosh and iPod designs.
3. **Plant patents:** New varieties of plants that have been asexually reproduced.
4. **Business method patent:** A type of utility patent covering a process or method, e.g., Amazon's "one-click" ordering process.

key concepts

Trade secrets

Patents

Trademarks

Copyrights

One of the main requirements of a **utility patent** is that the invention must be *non-obvious*.

The definition is that a "*person having ordinary skill in the art*" would not know how to solve the problem in the manner being disclosed without being told.

key concepts

Trade secrets

Patents

Trademarks

Copyrights

A **design patent** protects an *ornamental* design of a functional item.

Ornamental designs of jewelry, furniture, beverage containers and computer icons are examples of things that may be protected by design patents.

key concepts

Trade secrets

Patents

Trademarks

Copyrights

A patent application costs about \$20,000 to \$50,000 in legal fees. Not all applications ever result in an issued patent.

Litigation to enforce a patent even more expensive. Competitors may invent around a patent anyway.

key concepts

Trade secrets

Patents

Trademarks

Copyrights

A **trademark** is any distinctive word, name, symbol, slogan, shape, sound or logo that identifies the source of a product or service.

Renewable indefinitely as long as commercial use is proven.

May lose exclusive right to a trademark if it becomes generic, e.g., aspirin, thermos, cellophane.

key concepts

Trade secrets

Patents

Trademarks

Copyrights

A **copyright** is the right of an author to prevent others from printing, copying or publishing his or her original works.

Life of a copyright = life of the author + 70 years

A copyright exists from the moment of creation, even if there is no copyright notice.

To sue for infringement, must register your copyright with the US Copyright Office, but process is simple and cheap.

patents are property

They can be bought, sold, licensed, assigned or mortgaged.

They may passed to heirs of a deceased inventor.

If a patented invention is used without authorization, the patent holder may sue for money damages.

Work for hire

Only the author or those deriving rights from the author can rightfully claim copyright.

Exception: “Works made for hire.”

If a work is made for hire, an employer is considered the author even if an employee actually created the work. The employer can be a firm, an organization, or an individual.

Definition of a work for hire

Section 101 of the Copyright Act (title 17 of the U.S. Code.

Two parts:

1. A work prepared by an employee within the scope of his or her employment .
2. A work specially ordered or commissioned which the parties agree in a signed written document is a work made for hire and which is one of the following.
 - a. A contribution to a collective work
 - b. A part of a motion picture or other audiovisual work,
 - c. A translation,
 - d. A supplementary work,
 - e. A compilation,
 - f. An instructional text,
 - g. A test,
 - h. Answer material for a test, or
 - i. An atlas

Examples of works made for hire created in an employment relationship

1. A software program created by a staff programmer within the scope of his or her duties at a software firm.
2. A newspaper article written by a staff journalist for publication in the newspaper that employs the journalist (who is not a freelance writer).
3. A musical arrangement written for a music company by a salaried arranger on the company's staff .
4. A sound recording created by salaried staff engineers of a record company.

First sale doctrine

The physical ownership of an item such as a book, painting, manuscript or CD is not the same as owning the copyright to the work embodied in that item.

Ownership of a physical copy of a copyright-protected work permits lending, reselling, disposing, etc., of the item.

It does not permit reproducing the material, publicly displaying or performing it, or engaging in any of the acts reserved for the copyright holder.

Licensing

A contractual method of exploiting intellectual property by transferring rights to use without a transfer of ownership.

Rights to use are defined in a contract and usually require payment of a royalty or fee.

agenda

1. details
2. intellectual property
3. marketing

key concepts

The definition of a market.

The value proposition.

The product, substitutes and complementors.

Differentiation.

Barriers to entry and exit.

Buyers and heavy users.

key concepts

The definition of a market.

The value proposition.

The product, substitutes and complementors.

Differentiation.

Barriers to entry and exit.

Buyers and heavy users.

the definition of a market

Marketers require that to be an actual market that a business might operate in, it must be

identifiable,

substantial,

differentiable,

accessible,

stable, and

actionable.

the definition of a market

Marketers require that to be an actual market that a business might operate in, it must be

identifiable,
substantial,
differentiable,
accessible,
stable, and
actionable.

Identifiable means the buyers can be identified by some characteristics they share in common.

For consumers, occupation, age, where they live, hobbies.

For businesses, their SIC (Standard Industry Classification) code, location, areas served.

the definition of a market

Marketers require that to be an actual market that a business might operate in, it must be

identifiable,

substantial,

differentiable,

accessible,

stable, and

actionable.

Substantial means the market has to be big enough to support a business.

It can't be 3 people who want hammers with builtin WiFi.

the definition of a market

Marketers require that to be an actual market that a business might operate in, it must be identifiable, substantial, **differentiable**, accessible, stable, and actionable.

Differentiable means that potential customers must share characteristics that differentiate them from others who are unlikely to buy.

the definition of a market

Marketers require that to be an actual market that a business might operate in, it must be identifiable, substantial, differentiable, **accessible**, stable, and actionable.

Accessible means it's possible to reach these potential customers with your message and provide the product and service and you're selling at an affordable cost.

the definition of a market

Marketers require that to be an actual market that a business might operate in, it must be

identifiable,
substantial,
differentiable,
accessible,
stable, and
actionable.

Stable means you can make plans about the future.
There's a rule of law and it will be there tomorrow.

the definition of a market

Marketers require that to be an actual market that a business might operate in, it must be identifiable, substantial, differentiable, accessible, stable, and **actionable**.

Actionable means it's possible to create and act on a plan to address the market and make an attractive profit.

key concepts

The definition of a market.

The value proposition.

The product, substitutes and complementors.

Differentiation.

Barriers to entry and exit.

Buyers and heavy users.

key concepts

The definition of a market.

The value proposition.

The product, substitutes and complementors.

Differentiation.

Barriers to entry and exit.

Buyers and heavy users.

The value proposition

Value is the worth, importance, or usefulness to the customer. It is ***the value a business proposes to deliver***.

To be successful, a business must *create value*, selling goods or services that are more valuable than whatever it cost to create them.

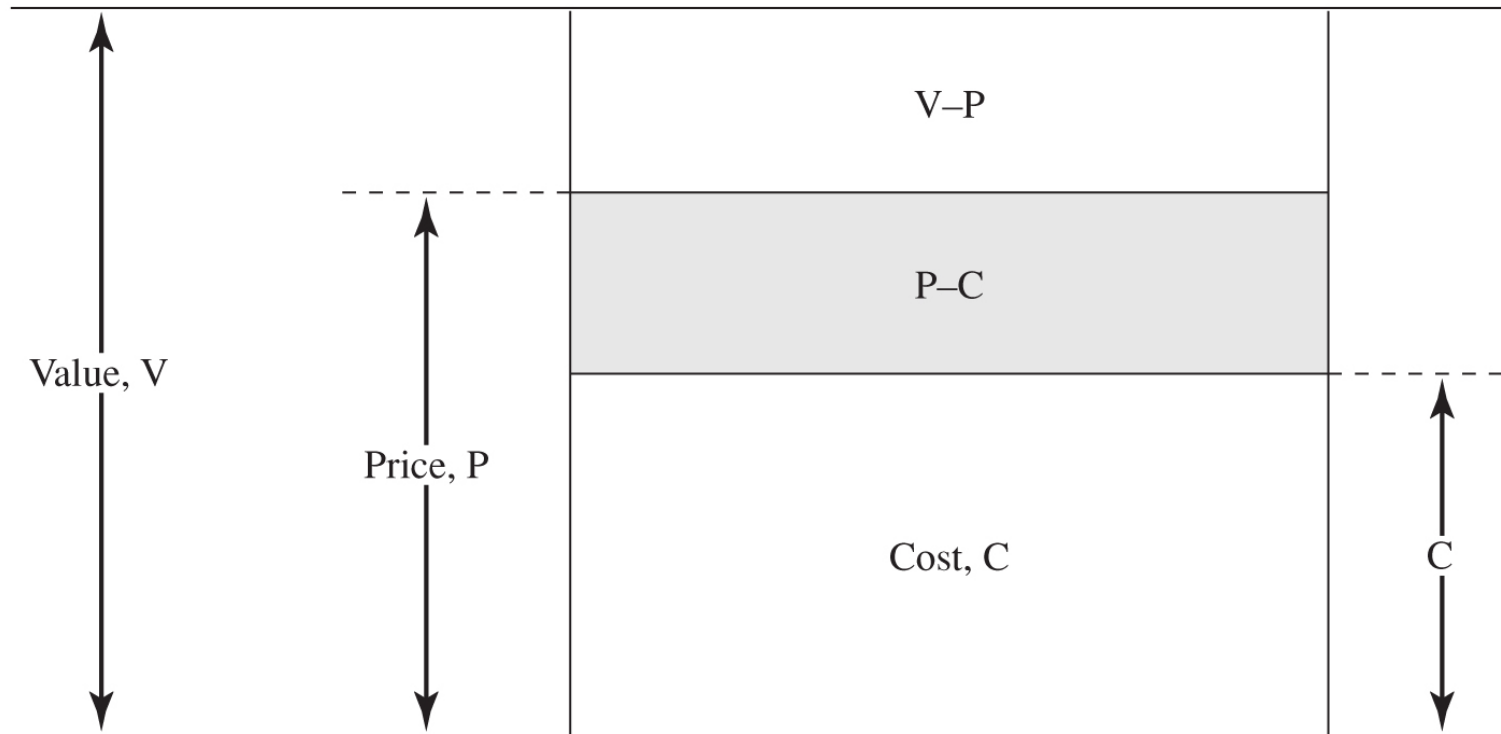


FIGURE 3.5 Value and return to the customer and the firm.

Source: Technology Ventures, 4th ed, p 58

Value propositions

Most value propositions offer some combination of these values to the customer:

1. Product
2. Price
3. Access
4. Service
5. Experience

Primary and secondary values

1. A ***primary value*** typically dominates the value proposition.
2. A ***secondary value*** typically differentiates the offering.
3. The remaining values must meet industry norms.

TABLE 3.7 Primary and secondary values for leading firms.

		Primary Value				
		Product	Price	Access	Service	Experience
Secondary Value	Product	—	Wal-Mart	Amazon.com	Honda	Harley-Davidson Disney World
	Price	Target	—	Holiday Inn	Wal-Mart	Olive Garden
	Access	Google Barnes & Noble	Priceline Visa	—	Dell Computer	Starbucks
	Service	Toyota Home Depot Intel	Southwest Airlines	McDonald's	—	Carnival Cruise Line
	Experience	Mercedes	Virgin Atlantic Best Buy	AT&T	Nordstrom	—

Source: Technology Ventures, 4th ed, p 57

TABLE 3.7 Primary and secondary values for leading firms.

			Primary Value			
			Price	Access	Service	Experience
Secondary Value	Product	—	Wal-Mart	Amazon.com	Honda	Harley-Davidson Disney World
	Price	Target	—	Holiday Inn	Wal-Mart	Olive Garden
	Access	Google Barnes & Noble	Priceline Visa	—	Dell Computer	Starbucks
	Service	Toyota Home Depot Intel	Southwest Airlines	McDonald's	—	Carnival Cruise Line
	Experience	Mercedes	Virgin Atlantic Best Buy	AT&T	Nordstrom	—

Wal-Mart is the leader in low prices and huge selection.

Source: Technology Ventures, 4th ed, p 57

TABLE 3.7 Primary and secondary values for leading firms.

				Primary Value		
				Access	Service	Experience
Secondary Value	Product	—	Wal-Mart	Amazon.com	Honda	Harley-Davidson Disney World
	Price	Target	—	Holiday Inn	Wal-Mart	Olive Garden
	Access	Google Barnes & Noble	Priceline Visa	—	Dell Computer	Starbucks
	Service	Toyota Home Depot Intel	Southwest Airlines	McDonald's	—	Carnival Cruise Line
	Experience	Mercedes	Virgin Atlantic Best Buy	AT&T	Nordstrom	—

price, selection, and convenience
continue to be at the core of
Amazon.com's value proposition

Source: Technology Ventures, 4th ed, p 57

TABLE 3.7 Primary

		Primary			Value	
Secondary Value	Product	—	Wal-Mart	Amazon.com	Service	Experience
					Honda	Harley-Davidson Disney World
	Price	Target	—	Holiday Inn	Wal-Mart	Olive Garden
	Access	Google Barnes & Noble	Priceline Visa	—	Dell Computer	Starbucks
	Service	Toyota Home Depot Intel	Southwest Airlines	McDonald's	—	Carnival Cruise Line
	Experience	Mercedes	Virgin Atlantic Best Buy	AT&T	Nordstrom	—

Our focus on retail sales to individual buyers has a direct correlation to the high resale value of **Honda** products, which is a key factor in the value proposition for our customers

Source: Technology Ventures, 4th ed, p 57

TABLE 3.7 Primary and secondary values for leading firms.

		Primary Value				
		Product	Price	Access	Service	Experience
Secondary Value	Product	—	Wal-Mart	Amazon.com	Honda	Harley-Davidson Disney World
	Price	Target	—	Holiday Inn	Wal-Mart	Olive Garden
	Access	Google Barnes & Noble	Priceline Visa	—	Dell Computer	Starbucks
	Service	Toyota Home Depot Intel	Southwest Airlines	McDonald's	—	Carnival Cruise Line
	Experience	Mercedes	Virgin Atlantic Best Buy	AT&T	Nordstrom	—

more power, greater efficiency and unmatched safety, backed with an improved value proposition. Not only is the new **S-Class** the most intelligent car on the road ...

Source: Technology ventures, 4th ed, p 57

TABLE 3.7 Primary and secondary values for leading firms.

		Primary Value				
		Product	Price	Access	Service	Experience
Secondary Value	Product	—	Wal-Mart	Amazon.com	Honda	Harley-Davidson Disney World
	Price	Target	—	Holiday Inn	Wal-Mart	Olive Garden
	Access	Google Barnes & Nob	Priceline	—	Dell Computer	Starbucks
	Service	Toyota Home Depot Intel	the Dell value proposition of aggressively priced systems custom-built for each customer.			Carnival Cruise Line
	Experience	Mercedes	Virgin Atlantic Best Buy	AT&T	Nordstrom	—

Source: Technology Ventures, 4th ed, p 57

TABLE 3.7 Primary and secondary values for leading firms.

		Primary Value				
		Product	Price	Access	Service	Experience
Secondary Value	Product	—	Wal-Mart	Amazon.com	Honda	Harley-Davidson Disney World
	Price	Target	—	Holiday	McDonald's is famous for its value proposition: food of a constant quality that is served quickly and consistently across the globe.	
	Access	Google Barnes & Noble	Priceline Visa	—		
	Service	Toyota Home Depot Intel	Southwest Airlines	McDonald's	—	Carnival Cruise Line
	Experience	Mercedes	Virgin Atlantic Best Buy	AT&T	Nordstrom	—

Source: Technology Ventures, 4th ed, p 57

TABLE 3.7 Primary and secondary values for leading firms.

		Primary Value				
		Product	Price	Access	Service	Experience
Secondary Value	Product	—	Wal-Mart	Amazon.com	Honda	Harley-Davidson Disney World
	Price	Target	—	Holiday Inn	Wal-Mart	Olive Garden
	Access	Google Barnes & Noble	Priceline Visa	—	Dell Computer	Starbucks
	Service	Toyota Home Depot Intel	Southwest Airlines	McDonald's	—	Carnival Cruise Line
	Experience	Mercedes	Virgin Atlantic Best Buy	Carnival built an unmatched value proposition on the promise of fun.		

Source: Technology Ventures, 4th ed, p 57

key concepts

The definition of a market.

The value proposition.

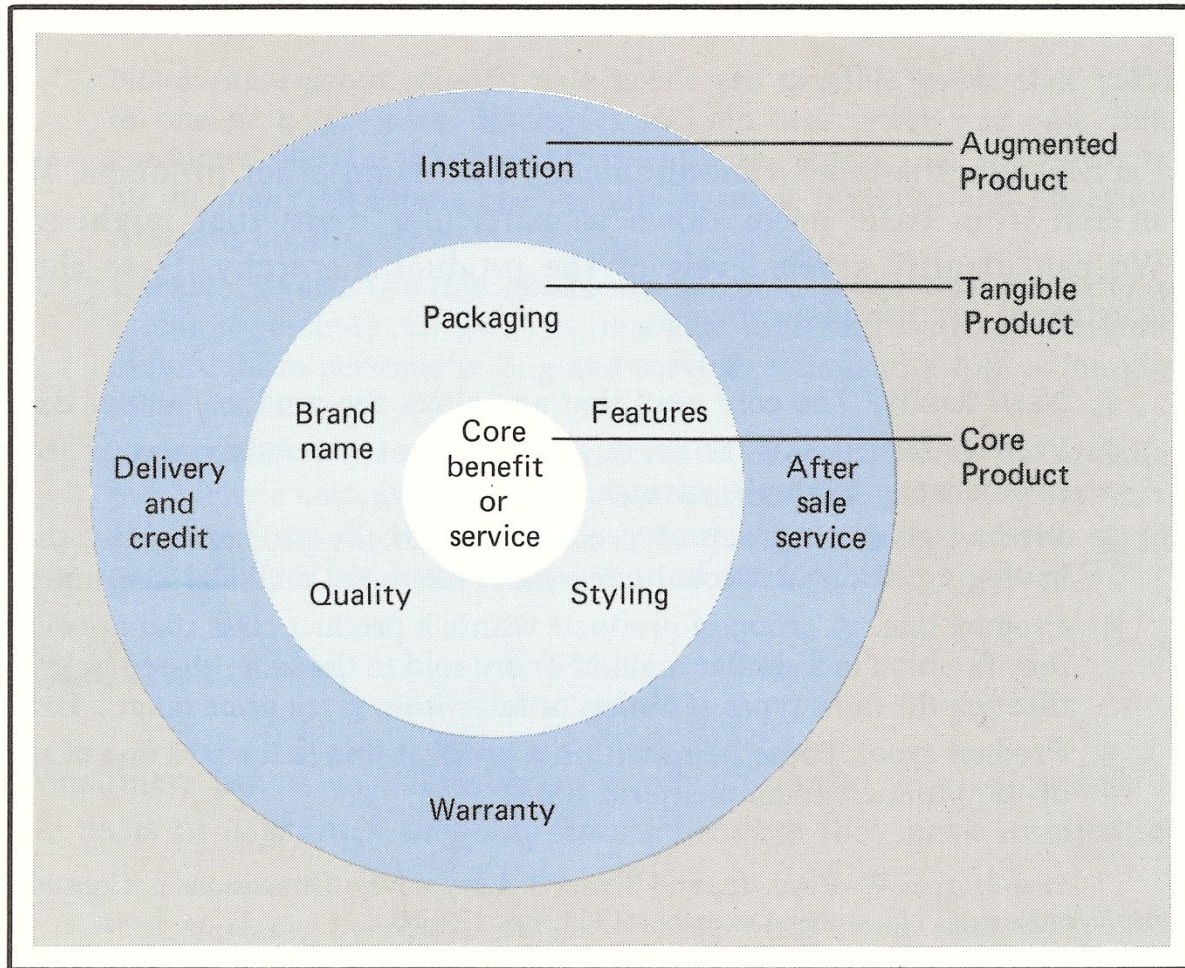
The product, substitutes and complementors.

Differentiation.

Barriers to entry and exit.

Buyers and heavy users.

FIGURE 15-1
Three Levels of Product



Substitution is the process by which one product or service supplants another in performing a particular function or functions for a buyer.

Source: Porter, *Competitive Advantage*, p. 273.

Examples of substitution

1. Apple pie instead of ice cream for dessert.
2. High fructose corn syrup instead of sugar.
3. A train instead of a truck to ship freight.
4. A bicycle or bus instead of a car to commute.
5. Skype instead of a plane ticket to attend a meeting in San Francisco.
6. Using less. E.g., thinner aluminum cans.
7. Used, recycled or reconditioned products.
8. Backward integration. Your buyer decides to do it himself.
9. Downstream substitution. E.g., electric cars don't need transmissions.

Complementors

Complementors are companies that sell complements to a firm's products.

A **complement** is a product that improves or perfects another product.

Examples: Video games for the Xbox, gas stations for automobiles, installation services for furnaces.

key concepts

The definition of a market.

The value proposition.

The product, substitutes and complementors.

Differentiation.

Barriers to entry and exit.

Buyers and heavy users.

Product differentiation means brand identification and customer loyalty stemming from past advertising, customer service, product differences or simply being first.

But it's also possible to differentiate in other ways.

The consumption sequence.

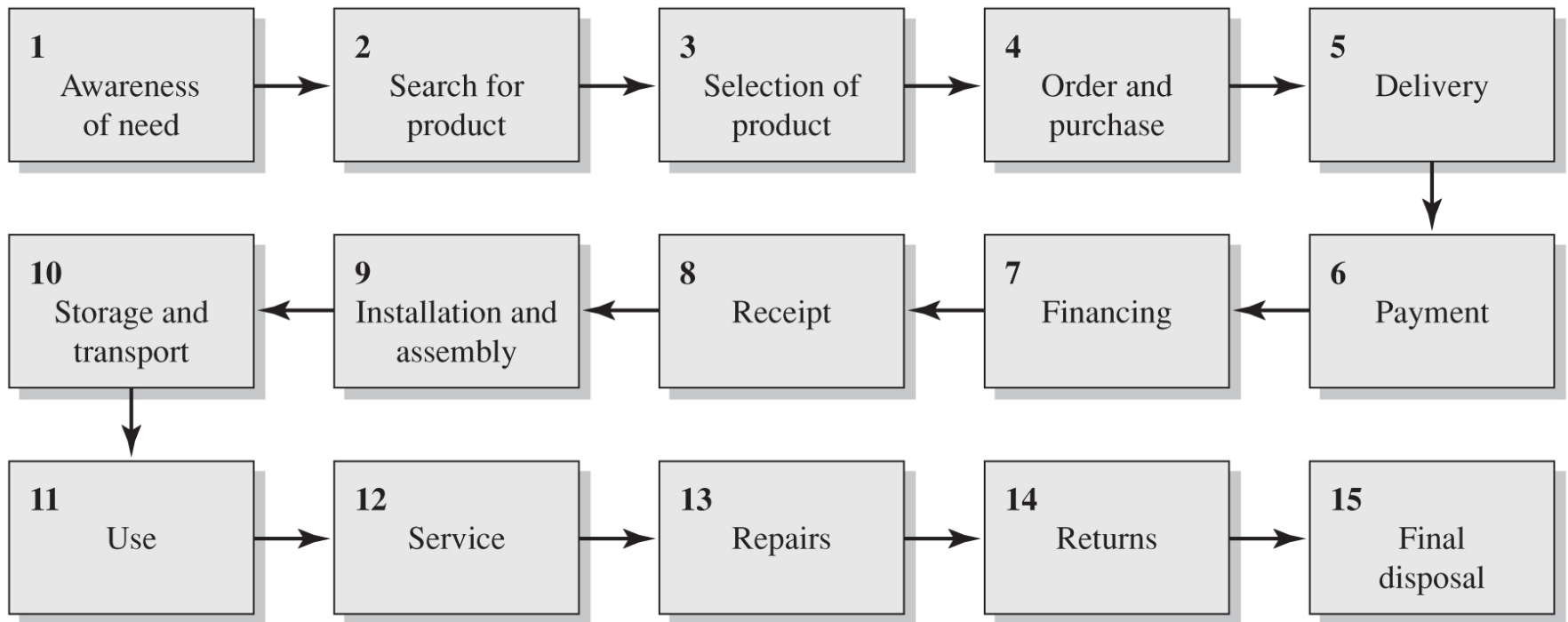


FIGURE 4.9 Consumption sequence.

An opportunity for differentiation exists anywhere in the consumption sequence.

key concepts

The definition of a market.

The value proposition.

The product, substitutes and complementors.

Differentiation.

Barriers to entry and exit.

Buyers and heavy users.

Barriers to entry are factors that make it costly for companies to enter an industry.

TABLE 4.5 Potential barriers to entry into an industry.

- Economies of scale
 - Cost advantages independent of scale
 - Product differentiation
 - Contrived deterrence
 - Government regulation
 - Switching costs
-

Product differentiation means brand identification and customer loyalty stemming from past advertising, customer service, product differences or simply being first.

Contrived deterrence occurs when firms throw up barriers at a cost to themselves.

Examples: Using lower prices, newer products or brand building to send a signal to potential entrants that intense responses will result if they try to enter.

Government can limit or foreclose entry with licensing requirements, limits on access to raw materials (e.g., zoning), air and water pollution standards, product safety and other requirements.

Switching costs are the costs to the customer to switch to a competitor.

Example: Switching from Windows to Mac OSX.

		Exit Barriers	
		Low	High
Entry Barriers	Low	Low, stable returns	Low, risky returns
	High	High, stable returns	High, risky returns

FIGURE 1-2. Barriers and Profitability

There can also be barriers to exit.

Source: Porter, *Competitive Strategy*, p. 22.

key concepts

The definition of a market.

The value proposition.

The product, substitutes and complementors.

Differentiation.

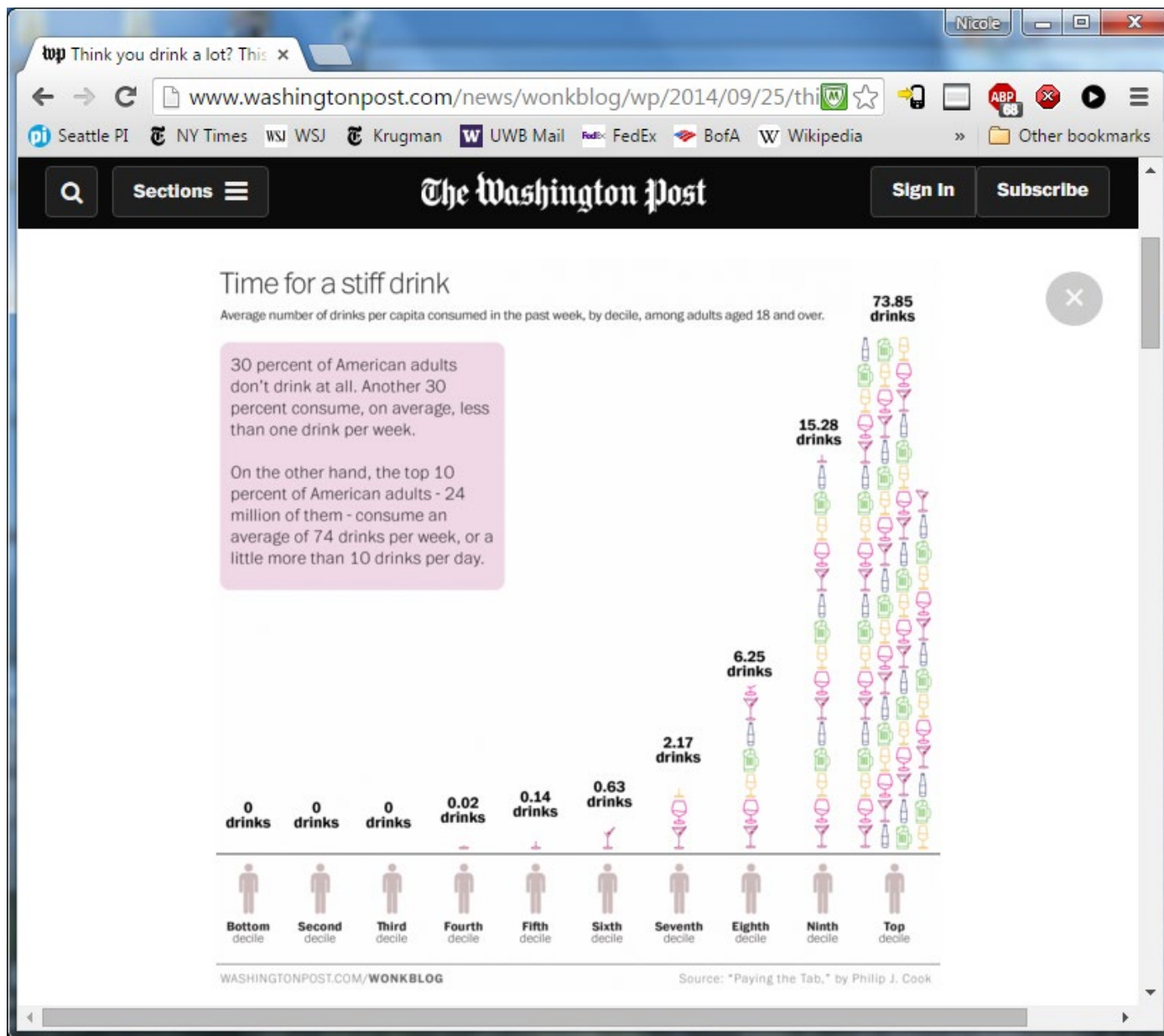
Barriers to entry and exit.

Buyers and heavy users.

Factors increasing the bargaining power of buyers

1. Large purchases relative to seller sales.
2. Purchases are a significant part of the buyer's costs.
3. Product is standard or a commodity.
4. Low switching costs.
5. Buyer earns low profits.
6. Credible threat of backward integration.
7. Product is unimportant to the quality of the buyer's products or services.
8. Buyer has full information.

Source: Porter, *Competitive Strategy*, pp. 24 – 26.



<http://www.washingtonpost.com/news/wonkblog/wp/2014/09/25/think-you-drink-a-lot-this-chart-will-tell-you/>

Consumer Behaviour - C.L. x

books.google.com/books?id=9i_xa8UsAUoC&pg=PA17&lpg=PA17&dq=beer+heavy+user&source=bl8

Google beer heavy user +Nicole Share

Books

GET PRINT BOOK

No eBook available

Amazon.com
Barnes&Noble.com
Books-A-Million
IndieBound

Find in a library
All sellers »

CONSUMER BEHAVIOUR

g+1 3

★★★★★

1 Review
Write review

Consumer Behaviour

By C.L. Tyagi, Arun Kumar

beer heavy user Go

About this book

Get Textbooks on Google Play

Result 1 of 1 in this book for beer heavy user

potential users, first-time users and regular users of a product. While high-market-share companies are particularly interested in converting potential users into actual users, smaller firms try to get users of competitive brands to switch to their brand. Potential users and regular users require different marketing approaches.

Social marketing agencies pay close attention to **user** status. For example, drug rehabilitation agencies sponsor rehabilitation programs to help regular users quit the habit. To discourage young people from trying drugs they sponsor talks by ex-users.

(iii) *Usage rate* : Markets are also segmented into light medium and **heavy user** groups of the product called volume segmentation. Though **heavy** users are often a small percentage of the market but they account for a high percentage of total consumption. In a research on usage rates for **beer** it was found that 68 per cent of the panel members did not drink **beer**. The 32 per cent who did were divided into two groups. The lower 16 per cent were light users and accounted for only 12 percent of total **beer** consumption. The **heavy** half accounted for 88 percent of the total consumption — that is, for over seven times as much consumption as the light users. Thus, a **beer** company would prefer to attract one **heavy user** to its brand over several light users.

Copyrighted material

Source: Tyagi, Kumar, *Consumer Behavior*, pp. 17-18. [[link](#)]

Consumer Behaviour - C.L. x

ei=bLArVMifNsLNiwKi3YCwCg&ved=0CCQQ6AEwAQ#v=onepage&q=beer%20heavy%20user&f=false

Google

beer heavy user

+Nicole

Share

Books

Page 18

Result 1 of 1 in this book for beer heavy user

Clear search

GET PRINT BOOK

No eBook available

Amazon.com
Barnes&Noble.com
Books-A-Million
IndieBound

Find in a library
All sellers »



8+1 3
★★★★★
1 Review
Write review

Consumer Behaviour
By C.L. Tyagi, Arun Kumar

beer heavy user

Go

About this book

Get Textbooks on Google Play

18

CONSUMER BEHAVIOUR

Most **beer** companies target the **heavy beer** drinker, using appeals such as Schaefer's "the one **beer** to have when you're having more than one."

The **heavy** users of a product have often common demographics, psychographics, and media habits. The profile of **heavy beer** drinkers shows the following characteristics : More of them are in the working class compared with light **beer** drinkers. Instead of under twenty-five and over fifty they fall between the ages of twenty-five and fifty. Instead of under two hours they watch television more than three and one-half hours per day. They prefer to watch sports programs. Profiles like this assist the marketer in developing price, message and media strategies.

Social marketing agencies often face a **heavy**-price, message and media strategies. Agency would normally target families who have the most children; but these families are also the most resistant to birth-control messages. The National Safety Council USA would target unsafe drivers; but these drivers are the most resistant to safe-driving appeals. The agencies must consider whether to go after a few highly resistant **heavy** offenders or many less resistant light offenders.

8. Consumer loyalty basis. Market can also be segmented by