

Session 10: Pricing

- **review of differentiation**
- **strategic decisions**
 - low-price or premium
 - mass market or niche
 - impact on channel partners
- **market tools can set the right price**
 - expected value in use (EVIU)
 - value to the channel (EVC)
 - breakeven analysis
 - conjoint analysis



If competition is imperfect, raising perceived value can have high leverage

- Annual demand = 100M units
- Variable costs = \$196
- Current price = \$200
- Current profit = \$400M

- What if we could raise perceived value (and price accordingly) by 1%? 10%?

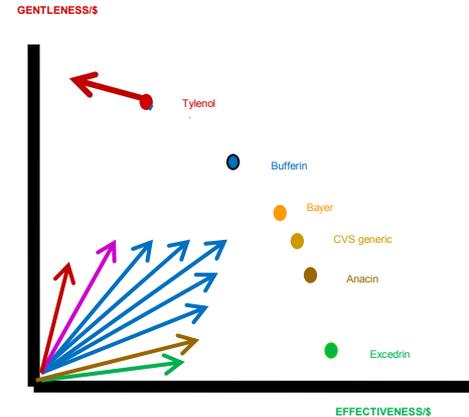
- Profit increases by _____%?

value = benefits vs. price



Making competition imperfect

- Tylenol (vs. aspirin)
- Snapple (quirky indulgence)
- Brita (vs. P&G)



	Taste	Impurities
Pitcher	Brita Dominates	PUR best on impurities
Faucet	Brita best tasting	PUR Dominates

Differentiation makes for “local monopolies”

- **Imperfect competition**
(“local monopolies”)
 - Perdue chickens



Local monopolies are better than commodity markets

- **Branding?**

- lobsters are caught by small boats (2.8M traps)
- sold at market price by boats
- key item in restaurants
- why not “Prelude” lobsters?



LEGAL LOBSTERS

from the crisp cold waters of the north atlantic

STEAMED

1.25 - 1.50 lb	27.95
1.50 - 1.75 lb	38.95
2.00 - 2.50 lb	49.95

LOBSTER BAKE

37.95
cup of clam chowder, steamers, mussels, chouriço, corn on the cob, steamed 1-1.25 lb. lobster (larger sizes available please inquire)

BAKED STUFFED LOBSTER add 5.00
shrimp and scallop buttery cracker stuffing

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Expected value in use (EVIU)

- **Unique benefits increases perceive value (hence price)**
- **In many markets, the unique benefits can be cost savings**
 - Expected value in use (EVIU)
 - EVIU =
 - Cost to customer without product
 - minus cost to customer with product

EVIU in pile-driving pads

U.S. Patent Jul. 3, 1984 Sheet 1 of 2 4,457,499

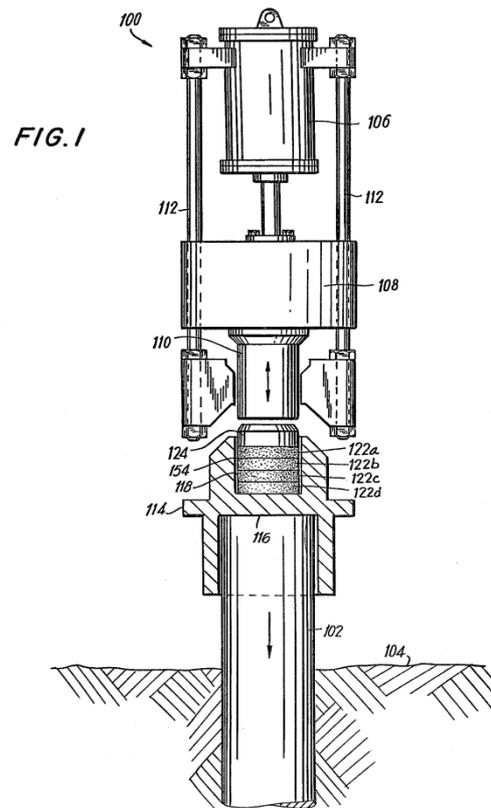
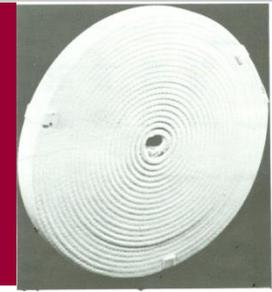


Image is in the public domain.

The pile-driving market



Curled metal pad

- **Pile Driving Pads**
 - driving piles generates heat, need pads
 - current solution is asbestos pads (toxic, change often, hot and dangerous)
 - proposal: curled metal pads (not toxic, lasts whole job, not as hot)
- **Players in the market (analogies to Aqualisa)**
 - pile-driving contractors: 75% own machines, 25% rent them
 - buy supplies from supply houses (if own machines) or rental companies
 - influenced by
 - architectural and consulting engineers
 - general contractors (who often have machine shops)

Expect value in use (EVIU)

Illustrative calculations

	Current Solution	CMI Pile-driving Pads	Savings to customer
Hours to drive 300 piles	100 hours	75 hours	25 hours
Set-up time	6 2/3 hours	4 minutes	6 2/3 hours
Net @ \$200/hour	\$21,334 = 106 2/3 hr x \$200/hr	\$15,000 = 75 hr x \$200/hr	\$6,334
Weight/handling temp	40 pounds/700°	15 pounds/250°	
Recycling costs	Asbestos	Curled metal	\$1,000
Price	\$1,000 = 20sets x \$50/set	1 set x CMI price/set	\$1,000 – CMI price
Net EVIU			\$8,334 – CMI price
Product cost			\$150/set
Minimum margin			50%

Key ideas so far

- **Differentiate (vs. competition)**
 - perceived value
 - reduce price competition
- **EVIU (to end customer)**
 - gives maximum price
 - achievable if patent, production, or image protection
- **Value to Channel (EVC)**
 - Sonance speakers



Expected value to the channel: Market for built-in speakers

Sonance speakers
Slightly better for customer.



**Typical dealer
installs about 450
units per year.**

**End customers
often defer to
dealer who is a
systems integrator.**

Speakercraft speakers
Much easier to install.



Images © Sonance; Speakercraft. All rights reserved. This content is excluded from our Creative Commons license. For more information, see <http://ocw.mit.edu/help/faq-fair-use/>.

Channel is important to pricing

- **Sonance speakers (custom installed)**

- Speakercraft streamlined installation, reduced cost
- savings to installers
 - reduced time to install
 - higher dealer margin per hour of labor

Dealer Economics	Speaker craft		Sonance
Retail price	\$365		\$400
Dealer margin	75%		65%
Return to dealer	\$275	75% of \$365	\$260
Time to install	½ hour		1 hour
Dealer cost/hour	\$60		\$60
Dealer cost installed	\$30	½hr x \$60/hr	\$60
Net profit dealer	\$245	\$275 – \$30	\$200



Sonance Architectural Series

- **Must do something to respond to Speakercraft**
- **Developed a new series of flush-mounted speakers.**
 - Technology innovation that helps the channel (now ½ hour)
 - Also substantially better for end customers
- **Pricing decision**
 - high-end niche
 - or, mass market



B/E analysis to evaluate a niche

- **Niche: smaller, but higher price**
- **Mass market: larger, but competitive price**
- **Breakeven (B/E)**
 - number of units that must be sold to cover fixed costs
 - compare to needed market share
 - useful in Aqualisa
 - conjoint analysis (next) determines if there is demand at that price



Sonance Architectural Series

- Compare mass and niche markets.
- For given prices, what share is needed.
- Strategic considerations
 - Speakercraft is a threat in mass market (EVC).
 - exclusive partners in niche

	Mass Market		Niche market
Retail price	\$750		\$2,500
Dealer price	\$305		\$875
Sonance cost	\$200		\$200
Dealer margin	\$415	$\$750 - \$305 - \$30$	\$1,595
Sonance margin	\$105	$\$305 - \200	\$625
Units per dealer	450		450

B/E and price-evaluations need conditional demand estimates

- We've seen intention scaling (as in XM Digital Satellite Radio).

- Conjoint analysis

Conjoint analysis is the most commonly applied marketing science method!



Taking everything into account, how likely are you to subscribe to XM radio at \$8 per month.

Certain, practically certain (99 in 100)	_____
Almost sure (9 in 10)	_____
Very probable (8 in 10)	_____
Probable (7 in 10)	_____
Good possibility (6 in 10)	_____
Fairly good possibility (5 in 10)	_____
Fair possibility (4 in 10)	_____
Some possibility (3 in 10)	_____
Slight possibility (2 in 10)	_____
Very slight possibility (1 in 10)	_____
No chance, almost no chance (1 in 100)	_____

Basic idea of conjoint analysis



Willingness-to-pay for features

- **Timbuk2 bags**

- **Consumers asked to choose among various bags with different features and prices.**

- **Obtain a willingness to pay for each feature, e.g., \$8 for the mesh pocket.**



A compared to B

Option A	Features that vary	Option B
\$100	Price	\$70
Yes	Handle	No
Yes	Mesh Pocket	No

As shown in the two images, the bags do not vary on the other features

For the scale touch the blue dot

Slightly prefer B

Next

← **Original prototypes**

Ideas are classic (but methods are modern)

- **Ford and the River Rouge Plant**
 - 2,000 acres, 120,000 employees, 53,000 machine tools, 90 miles of track, 27 miles of conveyors
 - power plant, glass plant, cement plant, paint, rubber, etc.
 - Model A



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From the GM archives.

PROVING GROUND OF PUBLIC OPINION

YOUR CAR AS
YOU
WOULD BUILD IT

★

1934

"There is only one person qualified to say just what the motorist prefers and that person is THE MOTORIST HIMSELF"



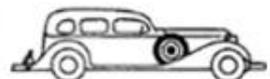
SPARE WHEEL MOUNTING

From your standpoint which is most desirable?

CHECK ANSWER



ONE SPARE AT REAR



FENDER "WELLS"



ENCLOSED AT REAR

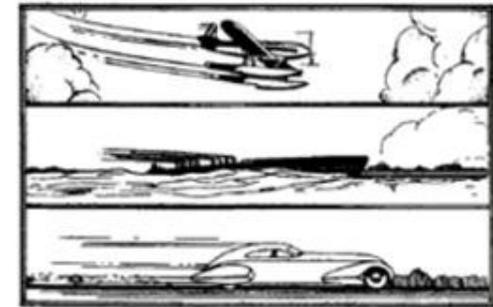
...tive desire to move about more rapidly and conveniently is definitely tied up with desire for style, appearance, comfort, and amenities which do not lend themselves to analysis."

"Art is not a thing separate and apart; art is only the best way of doing things."

— *Elbert Hubbard*

Do you favor the tendency towards
STREAMLINING?

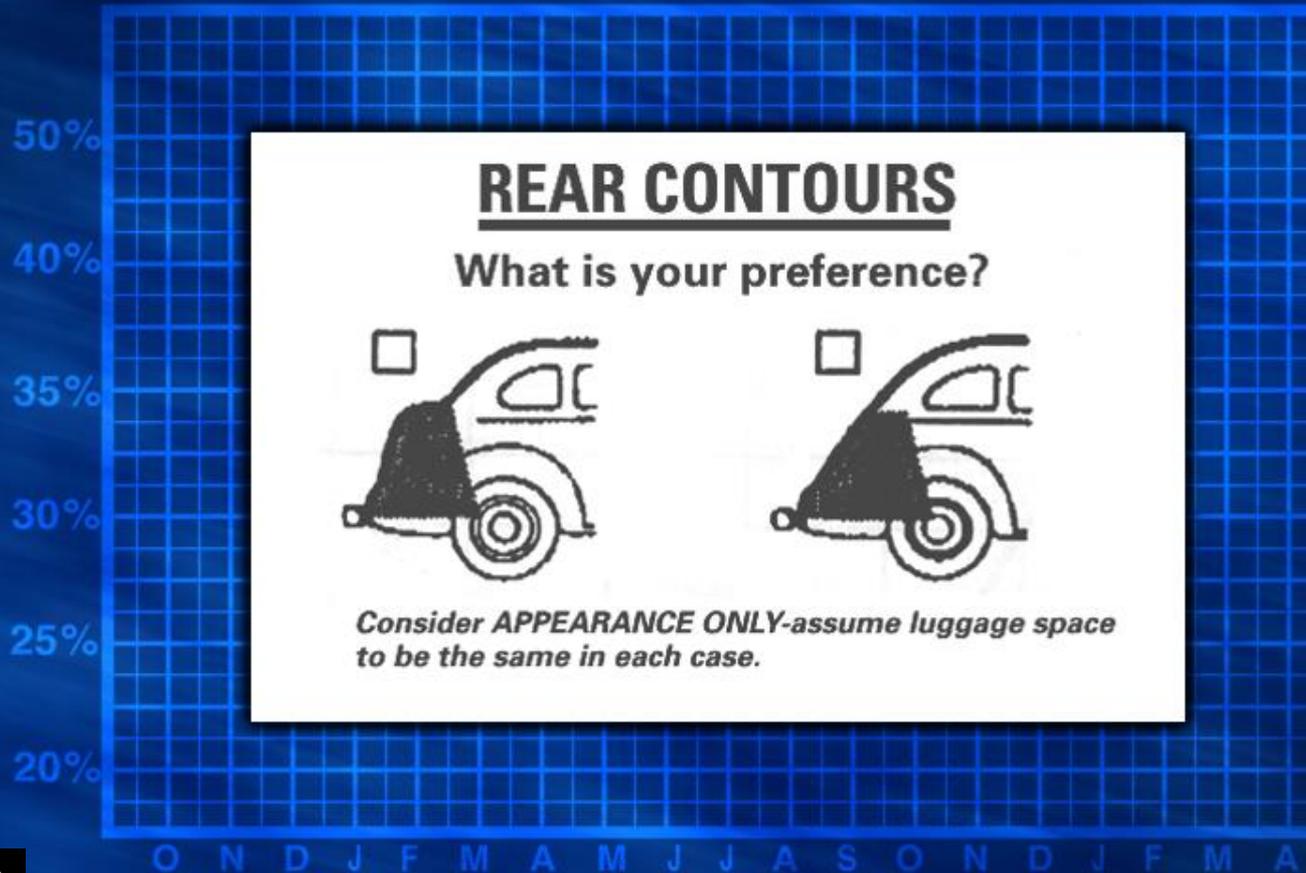
YES NO DON'T CARE



Of all the cars on the market, and without regard to price, which would you say is the best looking?

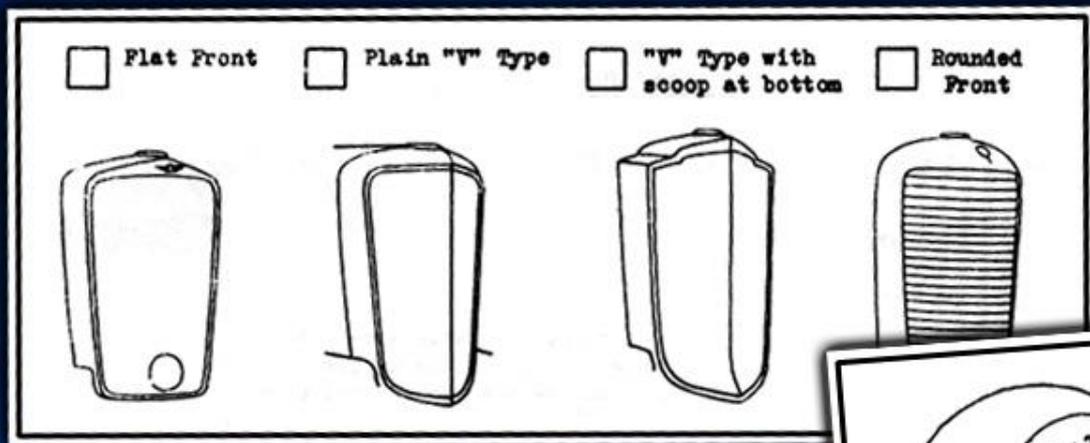


Consumers chose among rear contours



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Consumers chose among grills and starterator



*The Proving Ground
of Public Opinion*



Self-stated scales for many features



Check Your Appraisal

VERY LITTLE → → → A WHOLE LOT

Feature	0	\$1	\$5	\$10	\$15	\$20	\$25	\$30	\$40	\$50	Feature
DASH COMPARTMENT	0	\$1	\$5	\$10	\$15	\$20	\$25	\$30	\$40	\$50	DASH COMPARTMENT
ADJUSTABLE SEATS	0	1	5	10	15	20	25	30	40	50	ADJUSTABLE SEATS
INDEPENDENT SUSPENSION	0	1	5	10	15	20	25	30	40	50	INDEPENDENT SUSPENSION
STARTERATOR	0	1	5	10	15	20	25	30	40	50	STARTERATOR
SAFETY GLASS	0	1	5	10	15	20	25	30	40	50	SAFETY GLASS
CRANKCASE VENTILATION	0	1	5	10	15	20	25	30	40	50	CRANKCASE VENTILATION
AUTOMATIC CHOKE	0	1	5	10	15	20	25	30	40	50	AUTOMATIC CHOKE
SYNCRO-MESH	0	1	5	10	15	20	25	30	40	50	SYNCRO-MESH
STABILIZED FRONT END	0	1	5	10	15	20	25	30	40	50	STABILIZED FRONT END
HYDRAULIC BRAKES	0	1	5	10	15	20	25	30	40	50	HYDRAULIC BRAKES
NO-DRAFT VENTILATION	0	1	5	10	15	20	25	30	40	50	NO-DRAFT VENTILATION
ALL STEEL TOP	1	5	10	15	20	25	30	40	50	50	ALL STEEL TOP

What are they worth to You?



But for some products market experiments are not feasible.

- **Suppose you are designing a Maserati SUV**
 - automatic parking
 - auto-adjust acceleration – fuel saver, normal, sport, OMG
 - Bose active suspension
 - fire suppression
 - four vs. five seats
 - true off-road capability
 - Jeep vs. Ferrari engine
 - towing capability
 - active cruise control
 - standard transmission
 - Etc.



Courtesy of [Automobile Italia](#) on Flickr. License: BY.

How would you advise the CEO?

- **Which features would you add to the Maserati SUV?**
- **How would you price those features?**
- **How much should you pay to license a patented technology on automatic parking?**



Conjoint analysis determines consumers' willingness to pay

Maserati SUV

- Auto-adjust acceleration = \$1250
- Off-road capability = – \$500
- Auto parking = \$2,000
- Etc.

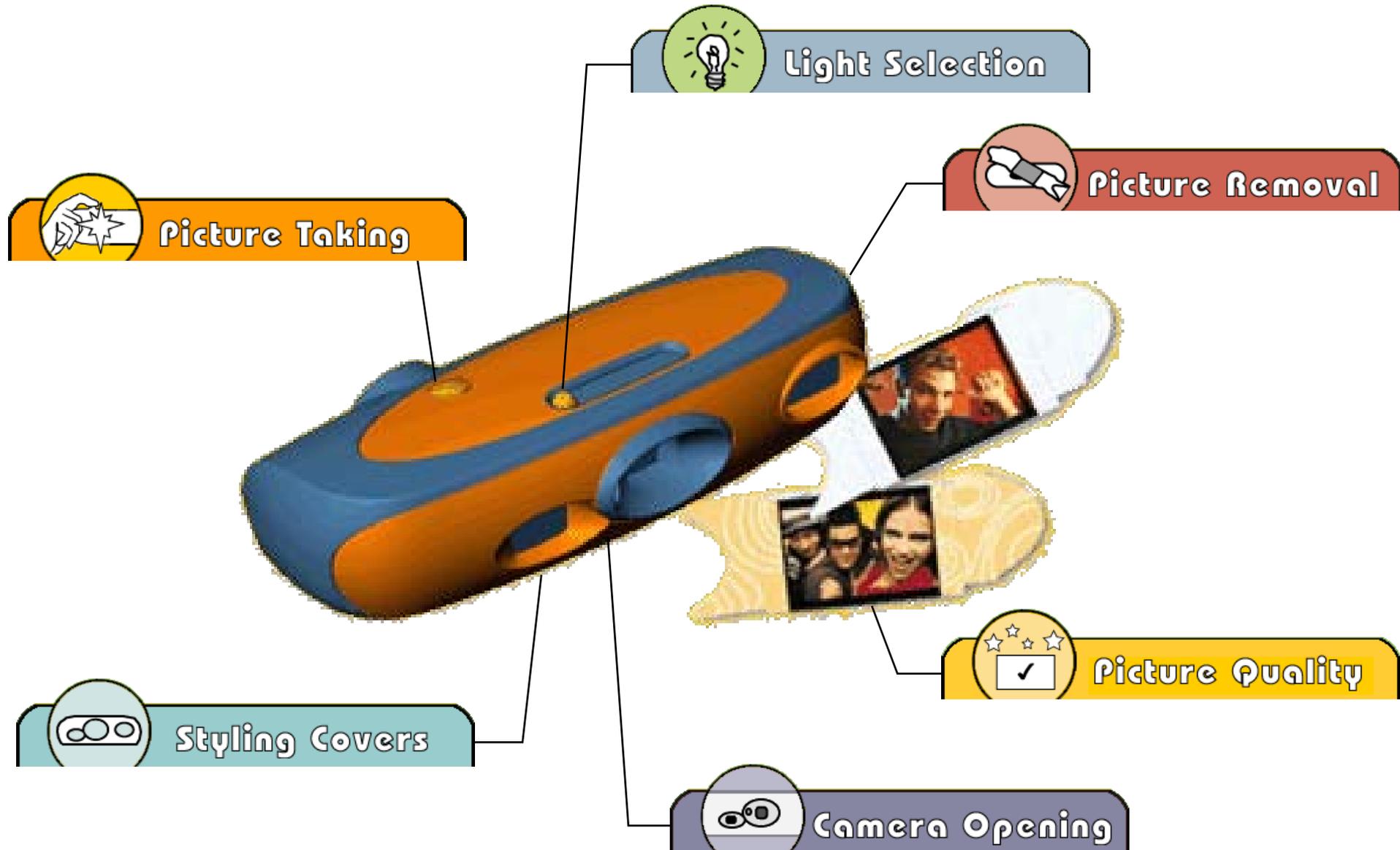
- Of course, we need to worry about segments, combinations of features, competition, and core strengths.

10,000+ applications yearly

- EZPass system
- Courtyard by Marriott
- RIM's Blackberry smartphones
- XM-Sirius service
- AMEX card service
- Intel chips
- Hallmark Cards
- GM cars
- Audi cars
- ...

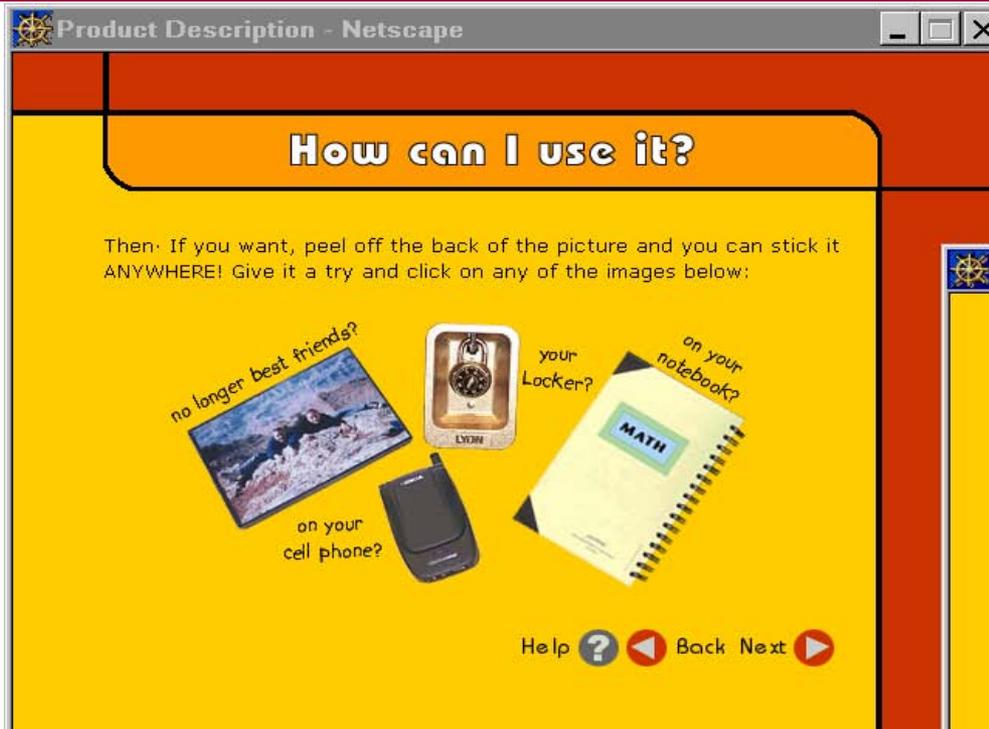


I-Zone camera illustration (classic CA)



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Familiarize consumers (kids) with features and category



Feature tradeoffs

8 Questions

Ready for something a little different? Here's what to do:

1. We are going to show you 8 different pairs of cameras with some of the features and options we just showed you.
2. For each of the 8 pairs, compare the 2 different cameras.
3. Click on the white circle below to tell us how much you like one camera compared to the other.
4. Touch the yellow dots to see what each white circle means
5. Try the example question below...



<i>Features</i>	Camera A	Camera B
Price	\$34.99	\$24.99
Picture Removal	Manual	Automatic
Picture Taking	2 Step	1 Step
Styling Covers	Changeable	Permanent

Need the scale? Touch the yellow dot



I like A completely more than B



I like B completely more than A

Click on the feature icons for a reminder.

Next

Back

Help



Conjoint data analysis output: Calculate willingness to pay

REGRESSION

Variables	B	Std. Error	t	Significance
Constant	15.5	5.6	2.7	.006
Price (\$34.99 vs. 24.99)	22.6	3.0	7.4	.000
Removable Covers	21.2	3.2	6.7	.000
Picture Quality	30.5	6.3	4.8	.000
Auto vs. 2-step	-0.8	2.8	-0.3	.763

Dependent Variable = Relative Preference Between Pairs of Profiles



Choice-based Conjoint analysis intuition

Satellite Television Service

	Profile 1	Profile 2
Network	Dish	Dish
Number of Channels	120	120
Premium Channels	3	3
Includes DVR	NO	YES
Price	\$35	\$40

Which product do you choose between the two?



Choice-based Conjoint analysis intuition

Satellite Television Service

	Profile 1	Profile 2
Network	Dish	Dish
Number of Channels	120	120
Premium Channels	3	3
Includes DVR	NO	YES
Price	\$35	\$40

Which product do you choose between the two?



Choice-based Conjoint analysis intuition

Satellite Television Service

	Profile 1	Profile 2
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Includes DVR	NO	YES
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Which product do you choose between the two?



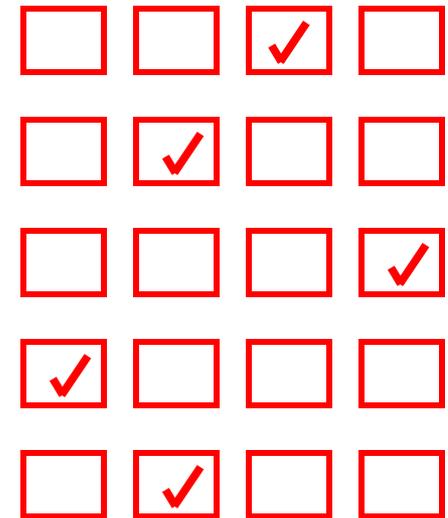
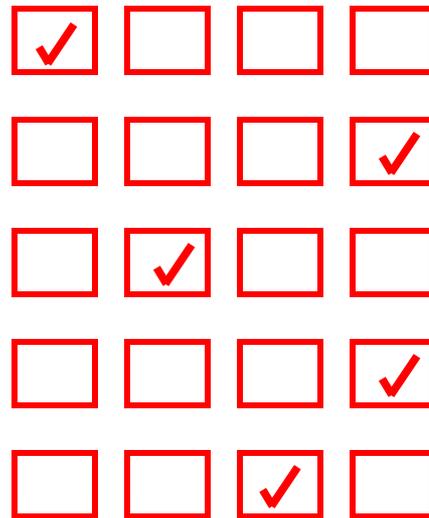
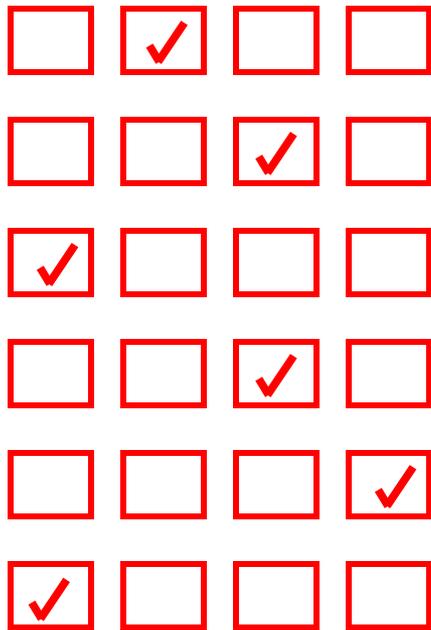
Would you buy the product you chose above at the indicated price?



Yes

No

Choice-based conjoint analysis – basic concept



16 choices x 3 inequalities per choice
x 450 consumers = 21,600 “constraints”
economic theory tells us low price preferred to
high price, etc. → many more “constraints”

***By analyzing choices among products,
we identify the value of all features.***



Apple v. Samsung I & II



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There was careful “craft”

- **Selection of panel**
- **Quality control**
 - pretests
 - CAPCHAs, ID verification, security controls
 - fast, slow, etc.
 - sensitivity analyses
- **State-of-art estimation (Hierarchical Bayes)**



Sawtooth Discover

Create your own conjoint study

The screenshot displays the Sawtooth Discover web interface. At the top, the header includes the Sawtooth Software logo, the text "Discover", and the user email "hauser@mit.edu". Below the header, a navigation bar contains "test2", "My Surveys", "Create New Survey", "Help", and "Contact Us". On the left, a sidebar lists "Questions", "Settings", "Survey Data", "Publish", and "Invite". The main content area features a "+ ADD QUESTION" button and a "TEST SURVEY" button. A modal window is open, showing a "Select" question type. The question text is "What is your favorite color?" and the options are "Red", "Green", "Blue", and "Orange", each with a radio button.

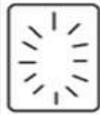
Caveat: “Craft” matters!

If these were your only options, which would you choose?

1 / 7

Case Color	Silver	Gold	Gold	NONE: I wouldn't choose any of these.
Watch Face	Round	Rectangular	Rectangular	
Band	Matching Metal	Black Leather	Brown Leather	
Price	\$249	\$299	\$349	
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

If these are the available smartwatches which one do you like best?

	Watch 1	Watch 2	Watch 3
Watch face:	 Rectangular	 Round	 Rectangular
Case color:	Gold-colored	Gold-colored	Silver-colored
Band:	Brown leather band	Matching metal band	Black leather band
Price:	\$ 349.-	\$ 399.-	\$ 299.-
Best option:	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Would you consider buying your preferred option if it was available?

- Yes
 No



State of the art “craft”

If these are the available smartwatches which one do you like best?

Please assume that all watches are from your preferred brand *Apple*, and are compatible with your smartphone so that they can show incoming messages or calls. Assume that all of these watches have a battery that lasts a day or more, a heart rate monitor, Bluetooth, high definition color LED touchscreen, 1.2 GHz processor, 4 GB storage, and 512 MB RAM.

To change the perspective view, click detail, top, or app:



	Watch 1	Watch 2	Watch 3
Watch face:	Rectangular	Round	Rectangular
Case color:	Gold-colored	Gold-colored	Silver-colored
Band:	Brown leather band	Matching metal band	Black leather band
Price:	\$ 349.-	\$ 399.-	\$ 299.-
Best option:	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Rectangular	Round	Rectangular
Gold-colored	Gold-colored	Silver-colored
Brown leather band	Matching metal band	Black leather band
\$ 349.-	\$ 399.-	\$ 299.-

Rectangular	Round	Rectangular
Gold-colored	Gold-colored	Silver-colored
Brown leather band	Matching metal band	Black leather band
\$ 349.-	\$ 399.-	\$ 299.-

Would you consider buying your preferred option if it was available?

- Yes
- No

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Simplified example

- **metric rather than choice-based**
- **no animations, rely on your imagination**
- **simple regression rather than HB logit**
- **only two prices**

- **but captures the basic intuition**



In-class example of conjoint analysis

- **Location**
 - Beacon Hill vs. Somerville
- **Size**
 - small (400 sq. ft. efficiency) vs. large (800 sq. ft. one-bedroom)
- **Finish**
 - tired vs. luxury
- **Rent**
 - \$800 vs. \$1,600



Rate your preferences

- **Option Juliet**
 - **Beacon Hill**
 - **One bedroom**
 - **Luxury**
 - **\$800 per month**
- **Option Mike**
 - **Somerville**
 - **Efficiency**
 - **Tired**
 - **\$1,600 per month**



100

0

Rate your preferences

- **Option Alfa**
 - **Beacon Hill**
 - **One bedroom**
 - **Tired**
 - **\$1,600 per month**
- **Option Bravo**
 - **Somerville**
 - **Efficiency**
 - **Luxury**
 - **\$1,600 per month**



Express your preference

Your preference

100

0

Apartment	Location	Size	Rent	Finish
Alfa	Beacon Hill	One bedroom	\$1600 per month	Tired
Bravo	Somerville	Efficiency	\$1600 per month	Luxury
Charlie	Beacon Hill	One bedroom	\$800 per month	Tired
Delta	Somerville	Efficiency	\$800 per month	Tired
Echo	Beacon Hill	Efficiency	\$800 per month	Luxury
Foxtrot	Beacon Hill	Efficiency	\$1600 per month	Tired
Golf	Somerville	Efficiency	\$800 per month	Luxury
Hotel	Somerville	One bedroom	\$1600 per month	Tired
India	Somerville	One bedroom	\$800 per month	Tired
Juliet	Beacon Hill	One bedroom	\$800 per month	Luxury
Kilo	Beacon Hill	Efficiency	\$1600 per month	Luxury
Lima	Beacon Hill	Efficiency	\$800 per month	Tired
Mike	Somerville	Efficiency	\$1600 per month	Tired
November	Somerville	One bedroom	\$800 per month	Luxury
Oscar	Somerville	One bedroom	\$1600 per month	Luxury
Papa	Beacon Hill	One bedroom	\$1600 per month	Luxury



Framing the price (consumer behavior review)

“This CD player costs less than players selling for twice as much”



Storer Cable communications (Louisville, Kentucky)

It's not often you get good news instead of a bill, but we've got some for you. If you've heard all those rumors about your basic cable rate going up \$10 or more a month, you can relax: *it's not going to happen!* The great news is the rate for basic cable is increasing only \$2 a month.

– Russo and Shoemaker – Framing Example



Summary

- **differentiation leads to imperfect competition**
- **strategic decisions**
 - low-price or premium
 - mass market or niche
 - impact on channel partners
- **market tools can set the right price**
 - expected value in use (EVIU)
 - value to the channel (EVC)
 - breakeven analysis (B/E)
 - conjoint analysis
 - framing and schema effects



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Fall 2015

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