Two Sides of Customer Value:

Economic Value to the Customer (EVC) and Life Time Value of a Customer (LTV)

Session 4
Marketing Management
Prof. Natalie Mizik
Marketing Management: The Big Picture

I. Situation Analysis (5Cs)
   - Collaborators
   - Customers
   - Company
   - Competition
   - Context

II. Set Strategy (STP)
   - Gmentation
   - Targeting
   - Positioning
   - Acquisition-Retention

III. Formulate Marketing Programs (4Ps)
   - Product
   - Price
   - Promotion
   - Place

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Sources of Customer Value

Psychological

Customer Value

Economic

Functional
1. Economic Value to Customers

- **EVC** is the total (life-cycle) cost savings from using a new product in place of a current product.

- **EVC** = (Total ownership cost of existing product) - (Total ownership cost of new product)

- **Maximum Willingness to Pay** = Total lifecycle savings from new product compared with old product
Example: New Telecom Switch

Benchmark comparison
$500 Usage and maintenance
$200 Installation
$300 Price

Value drivers of new solution
$400 Usage and maintenance
$100 Installation

Economic value
$125

Total cost of purchase
$0
$500
$1,000

Image by MIT OpenCourseWare.

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Sources of EVC

- **Price paid**: Amazon.com lower purchase price with the on-line purchase of books.
- **Acquisition costs**: American Hospital Supply reduces a hospital's cost with a computerized customer order program.
- **Usage costs**: Sealed Air reduces labor cost in packaging with AirCap.
- **Maintenance costs**: Saturn lowers the cost of repair and insurance through module product design.
- **Ownership costs**: GE Capital works with customers to create affordable ownership.
- **Disposal costs**: Rohm-Haas's Kathon MWX cuts cost of disposal of machine fluid waste in half.
Example

- Lasik
- The Canon and Lexmark printers are the cheapest, or are they?

<table>
<thead>
<tr>
<th></th>
<th>Black pages output</th>
<th>Color pages output</th>
<th>Cost per page</th>
<th>Printer cost</th>
<th>Total cost of ownership for 1 year</th>
<th>Total cost of ownership for 3 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canon i250 Color BubbleJet</td>
<td>103</td>
<td>387</td>
<td>6¢</td>
<td>$49.99</td>
<td>$227.04</td>
<td>$541.13</td>
</tr>
<tr>
<td>Canon i350 Color BubbleJet</td>
<td>111</td>
<td>382</td>
<td>6¢</td>
<td>$59.99</td>
<td>$229.69</td>
<td>$529.08</td>
</tr>
<tr>
<td>Epson Stylus C84</td>
<td>671</td>
<td>1,410</td>
<td>3¢</td>
<td>$100.00</td>
<td>$198.00</td>
<td>$534.00</td>
</tr>
<tr>
<td>HP Business Inkjet 1100d</td>
<td>1,326</td>
<td>3,378</td>
<td>2¢</td>
<td>$199.99</td>
<td>$271.99</td>
<td>$375.99</td>
</tr>
<tr>
<td>HP Deskjet 5150</td>
<td>381</td>
<td>310</td>
<td>8¢</td>
<td>$99.99</td>
<td>$336.62</td>
<td>$769.90</td>
</tr>
<tr>
<td>HP Deskjet 5650</td>
<td>456</td>
<td>456</td>
<td>6¢</td>
<td>$149.99</td>
<td>$333.86</td>
<td>$661.61</td>
</tr>
<tr>
<td>HP Deskjet 6127</td>
<td>673</td>
<td>902</td>
<td>4¢</td>
<td>$249.99</td>
<td>$380.22</td>
<td>$600.70</td>
</tr>
<tr>
<td>Lexmark Z605 Color Jetprinter</td>
<td>173</td>
<td>694</td>
<td>12¢</td>
<td>$50.00</td>
<td>$387.25</td>
<td>$1,021.74</td>
</tr>
<tr>
<td>Lexmark Z705 Photo Jetprinter</td>
<td>288</td>
<td>1,127</td>
<td>8¢</td>
<td>$80.00</td>
<td>$296.44</td>
<td>$689.31</td>
</tr>
</tbody>
</table>

▲ High scores are best. ▼ Low scores are best. Bold type denotes first place.

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Example

A new synthetic motor oil is about to be introduced with the primary benefit that it needs to be changed less frequently, specifically once every year regardless of the mileage. Assuming current oils need to be changed every 3,000 miles at a cost of $30 per change (oil at a dollar a quart or a total of $5 per car, labor $20, disposal of oil $5) for an average car. What is the EVC of the new oil to a car driver who drives 15,000 miles per year?
## EVC by Customer

<table>
<thead>
<tr>
<th></th>
<th>New Product</th>
<th>Old Product</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Low Mileage (3,000)</td>
</tr>
<tr>
<td>Product Price</td>
<td>???</td>
<td>1 x 5 = 5</td>
</tr>
<tr>
<td>Labor Costs</td>
<td>20</td>
<td>1 x 20 = 20</td>
</tr>
<tr>
<td>Other Costs (disposal fee)</td>
<td>5</td>
<td>1 x 5 = 5</td>
</tr>
<tr>
<td>TOTAL COST</td>
<td>25 + price</td>
<td>30</td>
</tr>
<tr>
<td>EVC</td>
<td>5</td>
<td>125</td>
</tr>
<tr>
<td>EVC/Quart</td>
<td>1</td>
<td>25</td>
</tr>
</tbody>
</table>
Issues in Using EVC

- Customer differences
  - High vs. low mileage drivers.

- Convincing customers

- Other (fuzzy) benefits ignored

- BUT, EVC can be useful in
  - Pricing
  - Segmentation
  - New product introduction
What is Customer Lifetime Value (CLV aka LTV)?

- Customer Lifetime Value

  is the net present value of all future streams of profits that a customer generates over the life of his/her business with the firm.
Creating or Destroying Value?

“In the United States, top executives lose their jobs when their companies sell too little. In Britain, it can happen when their companies sell too much.”

The Two Sides of Customer Value

Appropriating Value

Value of Customers

High

Low

Vulnerable Customers

Lost Cause

Star Customers

Free Riders

Value to Customers

Creating Value

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Value of Tennis Club Member

You own a tennis club where the annual membership fee is $300. The average club member spends about $100 dollars a year at the club (in balls, drinks, snacks, etc.). The annual cost of these miscellaneous goods (the balls, drinks, snacks, etc.) to you is $40 per player. On average people who join a tennis club have a playing career of 7 years. Historically, 65% of the members in a given year rejoin the following year. Investing capital at the going rate would earn a return of 8% a year. Based on this information, what is the long-term value of a customer?
# LTV Calculations

<table>
<thead>
<tr>
<th>Assumptions</th>
<th>Annual profit</th>
<th>Retention Probability</th>
<th>Expected profit</th>
<th>Discount factor</th>
<th>Expected discounted profit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Constant</td>
<td>r = .65</td>
<td>(D) = (B) x (C)</td>
<td>(E)</td>
<td>(F) = (D) x (E)</td>
</tr>
<tr>
<td>Year (A)</td>
<td>(B)</td>
<td>(C)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>360</td>
<td>1.00</td>
<td>360.00</td>
<td>1.00</td>
<td>360.00</td>
</tr>
<tr>
<td>1</td>
<td>360</td>
<td>0.65</td>
<td>234.00</td>
<td>0.93</td>
<td>216.67</td>
</tr>
<tr>
<td>2</td>
<td>360</td>
<td>0.42</td>
<td>152.10</td>
<td>0.86</td>
<td>130.40</td>
</tr>
<tr>
<td>3</td>
<td>360</td>
<td>0.27</td>
<td>98.87</td>
<td>0.79</td>
<td>78.48</td>
</tr>
<tr>
<td>4</td>
<td>360</td>
<td>0.18</td>
<td>64.26</td>
<td>0.74</td>
<td>47.23</td>
</tr>
<tr>
<td>5</td>
<td>360</td>
<td>0.12</td>
<td>41.77</td>
<td>0.68</td>
<td>28.43</td>
</tr>
<tr>
<td>6</td>
<td>360</td>
<td>0.08</td>
<td>27.15</td>
<td>0.63</td>
<td>17.11</td>
</tr>
</tbody>
</table>

LTV = 878.32
**Profit and Defection Patterns**

Credit Card Industry

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**Profit Pattern**

![Graph showing profit pattern with customer tenure and annual profit values]

**Defection Pattern**

![Graph showing defection pattern with customer tenure and accounts remain values]

\[
CLV = \left( \frac{\$42 \times 0.82}{1 + 0.1} \right) + \left( \frac{\$66 \times 0.76}{(1 + 0.1)^2} \right) + \ldots \rightarrow \left( \frac{m(r)}{1 + i} \right) + \left( \frac{m(r^2)}{(1 + i)^2} \right) + \ldots - AC
\]
Measuring Customer Value

- Lifetime value of a customer assuming infinite horizon:

\[ LV = m \left( \frac{r}{1 + i - r} \right) - AC \]

- \( m \) = margin
- \( i \) = discount rate
- \( r \) = retention rate
- \( AC \) = acquisition cost
Economics of Customer Acquisition for FedEx

- 140 accounts in advertising industry use 2,285 Courier Paks (CP) per month

- CP price is $12.50 and variable cost is $4.25

- Retention rate = 0.9, discount rate = 12%

- What is the maximum FedEx should be willing to spend to acquire a new account in this industry?
## Margin Multiple

### Constant Margins

\[
\frac{r}{1 + i - r}
\]

<table>
<thead>
<tr>
<th>Retention Rate</th>
<th>Discount Rate 10%</th>
<th>Discount Rate 12%</th>
<th>Discount Rate 14%</th>
<th>Discount Rate 16%</th>
</tr>
</thead>
<tbody>
<tr>
<td>60%</td>
<td>1.20</td>
<td>1.15</td>
<td>1.11</td>
<td>1.07</td>
</tr>
<tr>
<td>70%</td>
<td>1.75</td>
<td>1.67</td>
<td>1.59</td>
<td>1.52</td>
</tr>
<tr>
<td>80%</td>
<td>2.67</td>
<td>2.50</td>
<td>2.35</td>
<td>2.22</td>
</tr>
<tr>
<td>90%</td>
<td>4.50</td>
<td>4.09</td>
<td>3.75</td>
<td>3.46</td>
</tr>
</tbody>
</table>
# Margin Multiple

## Growth in Margins

\[
\frac{r}{1 + i - r(1 + g)}
\]

<table>
<thead>
<tr>
<th>Retention Rate</th>
<th>0%</th>
<th>2%</th>
<th>4%</th>
<th>6%</th>
<th>8%</th>
</tr>
</thead>
<tbody>
<tr>
<td>60%</td>
<td>1.15</td>
<td>1.18</td>
<td>1.21</td>
<td>1.24</td>
<td>1.27</td>
</tr>
<tr>
<td>70%</td>
<td>1.67</td>
<td>1.72</td>
<td>1.79</td>
<td>1.85</td>
<td>1.92</td>
</tr>
<tr>
<td>80%</td>
<td>2.50</td>
<td>2.63</td>
<td>2.78</td>
<td>2.94</td>
<td>3.13</td>
</tr>
<tr>
<td>90%</td>
<td>4.09</td>
<td>4.46</td>
<td>4.89</td>
<td>5.42</td>
<td>6.08</td>
</tr>
</tbody>
</table>
Increasing Customer Equity:

Three strategies:

I. Customer acquisition (gain new customers)

II. Customer expansion

III. Customer retention

\[ LV = m \left( \frac{r}{1+i-r} \right) - AC \]
Drivers of CLV

Financial Value

Customer Equity

Drivers of Customer Value

CUSTOMER ACQUISITION

CUSTOMER PROFITABILITY

CUSTOMER RETENTION

CUSTOMER EXPANSION

FIRM VALUE

PROFITS & CASH FLOW

CUSTOMER PROFITABILITY

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I. Customer Acquisition Strategies

- Marketing E*Trade
- Affiliations amazon.com
- Merges and Acquisitions AT&T
## Customer Acquisition Costs by Marketing Activity

<table>
<thead>
<tr>
<th>Activity</th>
<th>Cost per New Customer</th>
<th>Cost per Solicitation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personal selling</td>
<td>$500</td>
<td>$100.00</td>
</tr>
<tr>
<td>Direct mail</td>
<td>$115</td>
<td>$1.50</td>
</tr>
<tr>
<td>Telemarketing</td>
<td>$95</td>
<td>$3.30</td>
</tr>
<tr>
<td>Web site, e-mail</td>
<td>$30</td>
<td>$0.06</td>
</tr>
</tbody>
</table>

1. Costs are based upon typical industry averages. Response rates are implied.
2. Actual costs vary from business to business depending on the complexity of the sales process.

***Source: Customer acquisition cost--a key marketing metric. Justin Zohn. NPN, National Petroleum News, April 2003.***

All Customers are Important, but…

…some are More Important than Others

Source: Kanthal (A), HBS Case 9-190-002
Kanthal is a Swedish B2B selling hearing wires

Source: Prof. Natalie Mizik – 2010 MIT 15.810

Customer Retention
Profit Impact of 5% Increase in Customer Retention

Customer Retention (why think long term?)

Impact on Profit

- Profit from price premium
- Profit from referrals
- Profit from reduced cost
- Profit from increased purchases
- Base profit

# Under-investing in Retention

## PRIMARY MARKETING GOALS1 OF U.S. B-TO-B MARKETERS

<table>
<thead>
<tr>
<th></th>
<th>2004</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customer acquisition</td>
<td>28.4%</td>
<td>28.4</td>
</tr>
<tr>
<td>Driving sales</td>
<td>31.8</td>
<td>26.8</td>
</tr>
<tr>
<td>Brand awareness</td>
<td>15.6</td>
<td>17.5</td>
</tr>
<tr>
<td>Lead generation</td>
<td>14.2</td>
<td>16.4</td>
</tr>
<tr>
<td>Customer retention</td>
<td>7.1</td>
<td>7.7</td>
</tr>
</tbody>
</table>

1 As a percentage of respondents of more than 300 marketing executives

Source: BtoB Magazine, Chicago and eMarketer Inc., New York
What Drives Retention and Loyalty?

CUSTOMER RETENTION & LOYALTY

Experience
Loyalty Programs
Cross-selling

Whiskey Blue Destination Bars
Whatever/Whenever Service

“Business travelers with a sense of style can’t get enough of the W Hotel chain”

– Entrepreneur Magazine
III. Customer Expansion: Strategies to Increase Margin

- Pricing
- Share of Wallet
- Redefining your business
- Cross-Selling
Impact of Cross-Selling at Cox

Average Monthly Customer Churn

<table>
<thead>
<tr>
<th>Service</th>
<th>Churn Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Video Only</td>
<td>3.0%</td>
</tr>
<tr>
<td>Video + Internet</td>
<td>2.3%</td>
</tr>
<tr>
<td>Video + Phone</td>
<td>2.2%</td>
</tr>
<tr>
<td>Internet + Phone</td>
<td>1.9%</td>
</tr>
<tr>
<td>Video + Internet + Phone</td>
<td>1.4%</td>
</tr>
</tbody>
</table>

Source: www.cox.com

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Easier Said Than Done

AOL’s Vision or Pipe Dream?

Average revenue per user

Monthly Revenue

$24.37 (includes advertising)

Now

Projected

$159

Games & entertainment

$15

Voice services

$20

Mobile services

$20

Music

$30

Family plan (multiple devices on one subscription)

$30

Broadband access

$24

AOL subscription

Source: Fortune, Feb 4, 2002
What Drives Firm Value?

1% improvement in ...

… creates % improvement in firm value of

- Retention Rate: 4.9
- Margin: 1.1
- Discount Rate: 0.9
- Acquisition Cost: 0.1

Huge Earnings Potential

Expected increase in earnings before interest, taxes, depreciation, and amortization (EBITDA) for typical US wireless carrier, percent

- 9.9% growth in revenue
- 8.9% growth in revenue
- $1.5 billion growth in EBITDA
- 4.5% growth in EBITDA margin
- 23.4% increase in total earnings

Implementing customer lifetime management can lead to increase equivalent to:

Reduce churn: 9.9%
Increase average revenue per user: 6.9%
Reduce cost to serve customer: 3.1%
Reduce cost to add new customer: 3.0%
Reduce cost to bad debt: 0.5%
Total increase: 23.4%

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Conclusion

- Customers are assets

- Lifetime value of a customer can be approximated as
  \[ LV = m \left( \frac{r}{1+i-r} \right) - AC \]

- Three key levers of growth
  - customer acquisition (AC)
  - customer retention (r)
  - customer expansion (m)

- “Success is getting the right customers ... and keeping them.”

Charles Cawley, Founder MBNA
Appendix: Modeling Customer Value

Time 0 $n_0$
1 $n_0r$ $n_1$
2 $n_0r^2$ $n_1r$ $n_2$
3 $n_0r^3$ $n_1r^2$ $n_2r$ $n_3$
4 $n_0r^4$ $n_1r^3$ $n_2r^2$ $n_3r$ $n_4$

\[ n_0 \sum_{t=0}^{\infty} \frac{m_t r^t}{(1+i)^t} - n_0 c_0 \]

\[ n_1 \sum_{t=1}^{\infty} \frac{m_{t-1} r^{t-1}}{(1+i)^{t-1}} - n_1 c_1 \]

\[ \frac{n_1}{(1+i)} \sum_{t=1}^{\infty} \frac{m_{t-1} r^{t-1}}{(1+i)^{t-1}} - \frac{n_1 c_1}{1+i} \]
Value of Customer Base

- **In discrete time**

\[
Value = \sum_{k=0}^{\infty} \frac{n_k}{(1+i)^k} \sum_{t=k}^{\infty} \frac{m_{t-k}r^{t-k}}{(1+i)^{t-k}} - \sum_{k=0}^{\infty} \frac{n_k c_k}{(1+i)^k}
\]

- **In continuous time**

\[
Value = \int_{k=0}^{\infty} \int_{t=k}^{\infty} n_k m_{t-k} e^{-ik} e^{-\left(\frac{1+i-r}{r}\right)(t-k)} \ dt \ dk - \int_{k=0}^{\infty} n_k c_k e^{-ik} \ dk
\]

If you **enjoyed** Behavioral Econ Lecture last week

**this mktg elective is for YOU:**

**Consumer Behavior**

15.847

Professor Joshua Ackerman

---

*How do we know what to buy? What information captures our attention? When are we most susceptible to being persuaded? What shapes our decisions?*

This class will help you develop a basic understanding of cognition and decision making as they apply to marketing contexts, and become familiar with the major research methods for analyzing consumer behavior

**Topics include:**
Influence techniques, Self-control, Behavioral decision theory, Nonconscious processing, Cognitive biases, Social consumption

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**MARKETING**

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If you enjoyed LTV Lecture today
this mktg elective is for YOU:

15.840: Customer Analytics Using Probability Models

- Professor Michael Braun.
- Most of what drives customer behavior is unobservable
  - Still, there are regular patterns in activity that managers can exploit, even when we know nothing about specific customers
  - “Probability” lets us incorporate what we know, and don’t know, about these patterns, in a rigorous, systematic way
- Goal of this class: mastery of cutting-edge quantitative methods that enable you to analyze customer data correctly
  - Structured thinking, not wild, assumptions
  - Decision-making under uncertainty: doing it well
  - Build models from the ground up (going “under the hood”), so you understand exactly what’s going on.
- Full disclosure: it’s hard-core quant.
  - Designed to be accessible to any Sloan MBA who did well in DMD.
  - Still, it’s not for everyone. See Prof. Braun if you have questions.
15.840: Customer Analytics Using Probability Models

- Selection of topics covered
  - Modeling customer lifetimes and customer retention
  - Estimating customer lifetime value
  - Forecasting adoption of new products
  - Modeling repeat purchases
  - Measuring and forecasting media exposures
  - The “80/20” rule: what is it really?
  - Using test marketing data to segment and target customers
  - What was the effect of 9-11 on the online travel industry?
  - “Buy Until Dead” models: will your previous customers ever return?
  - Understanding and exploiting metrics of brand effectiveness (and why most of them are useless)