

Class 1: Quantifying Customer Value

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Customer Analytics

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Customer-centricity refocuses the attention of the firm

PRODUCT-CENTRIC MARKETING

- Product Focus
- Transactions
- Acquiring Customers
- Product Profitability



CUSTOMER-CENTRIC MARKETING

- Customer Focus
- "Relationships"
- Retaining Customers
- **Customer Profitability**

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Class Objectives

- How can we quantify the economic value of a customer?
- How can we use customer value to guide marketing and product decisions in
 - Acquisition
 - Development
 - Retention

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Customer value is usually measured by the revenue or profit generated by the customer

ALTERNATIVE APPROACHES TO CUSTOMER VALUE

		CASH FLOW	
		Inflow	In- and Outflow
BEHAVIOR CAPTURED	Past	Revenue	Profit
	Past and future		Life Time Value (LTV or CLV)

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Durham Home Improvement wants to determine the value of a “SaverCard” customer

EXAMPLE 1: DURHAM HOME IMPROVEMENT

- Durham Home Improvement (DHI) is the chief local competitor to Home Depot specializing in materials for home improvement
- DHI runs a “SaverCard” program where consumers earn credits for free home improvement classes (1 hour per \$200 spent)
- DHI has determined from their customer information file that for the average SaverCard carrier:
 - **Revenue** is \$200 per year after sign-up
 - **Cost of goods sold** (COGS) is 60% of gross revenue, i.e. \$120 per year
 - **Marketing costs**
 - Cost of attended home improvement seminars is \$25 per year

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The value of a DHI SaverCard customer is \$55

CUSTOMER VALUE CALCULATION

	One Year
Revenues	\$200
Product/ Service Costs	\$120
Marketing Costs	\$25
Customer Profit	\$55

	Inflow	In- and Outflow
Past	Revenue	Profit
Past and future		Life Time Value (LTV)

- How far into the future?
DHI comfortable thinking 5 years ahead

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We can calculate the value looking into the future

CUSTOMER VALUE CALCULATION

	Year 1	Year 2	Year 3	Year 4	Year 5
Revenues	\$200	\$200	\$200	\$200	\$200
Product/Service Costs	\$120	\$120	\$120	\$120	\$120
Marketing Costs	\$25	\$25	\$25	\$25	\$25
Customer Profit	\$55	\$55	\$55	\$55	\$55

Total Customer Value: $5 \cdot \$55 = \275

Two Problems:

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We can calculate the value looking into the future

CUSTOMER VALUE CALCULATION

	Year 1	Year 2	Year 3	Year 4	Year 5
Revenues	\$200	\$200	\$200	\$200	\$200
Product/Service Costs	\$120	\$120	\$120	\$120	\$120
Marketing Costs	\$25	\$25	\$25	\$25	\$25
Customer Profit	\$55	\$55	\$55	\$55	\$55

Total Customer Value: $5 \cdot \$55 = \275

Two Problems:

- Profits earned in 5 years are less valuable than profits earned today
- Customer may not be around in 5 years

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30% of SaverCard customers become inactive each year

CUSTOMER VALUE CALCULATION

	Today	Year 1	Year 2	Year 3	Year 4	Year 5
Revenues	\$0	\$200	\$200	\$200	\$200	\$200
Product/ Service Costs	\$0	\$120	\$120	\$120	\$120	\$120
Marketing Costs	\$0	\$25	\$25	\$25	\$25	\$25
Customer Profit	\$0	\$55	\$55	\$55	\$55	\$55
Probability of being active	100%	70%				

100*30% = 30 become
inactive
==> 70 remain active

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30% of SaverCard customers become inactive each year

CUSTOMER VALUE CALCULATION

	Today	Year 1	Year 2	Year 3	Year 4	Year 5
Revenues	\$0	\$200	\$200	\$200	\$200	\$200
Product/ Service Costs	\$0	\$120	\$120	\$120	\$120	\$120
Marketing Costs	\$0	\$25	\$25	\$25	\$25	\$25
Customer Profit	\$0	\$55	\$55	\$55	\$55	\$55
Probability of being active	100%	70%	49%			

70*30% = 21 become
inactive
==> 49 remain active

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30% of SaverCard customers become inactive each year

CUSTOMER VALUE CALCULATION

	Today	Year 1	Year 2	Year 3	Year 4	Year 5
Revenues	\$0	\$200	\$200	\$200	\$200	\$200
Product/ Service Costs	\$0	\$120	\$120	\$120	\$120	\$120
Marketing Costs	\$0	\$25	\$25	\$25	\$25	\$25
Customer Profit	\$0	\$55	\$55	\$55	\$55	\$55
Probability of being active	100%	70%	49%	34%	24%	17%

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Fix 1: We have to adjust profits to account for the fact that a customer may become inactive in the future

CUSTOMER VALUE CALCULATION

	Today	Year 1	Year 2	Year 3	Year 4	Year 5
Revenues	\$0	\$200	\$200	\$200	\$200	\$200
Product/ Service Costs	\$0	\$120	\$120	\$120	\$120	\$120
Marketing Costs	\$0	\$25	\$25	\$25	\$25	\$25
Customer Profit	\$0	\$55	\$55	\$55	\$55	\$55
Probability of being active	100%	70%	49%	34%	24%	17%
Profit expected on average	\$0	\$39				

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Fix 1: We have to adjust profits to account for the fact that a customer may become inactive in the future

CUSTOMER VALUE CALCULATION

	Today	Year 1	Year 2	Year 3	Year 4	Year 5
Revenues	\$0	\$200	\$200	\$200	\$200	\$200
Product/Service Costs	\$0	\$120	\$120	\$120	\$120	\$120
Marketing Costs	\$0	\$25	\$25	\$25	\$25	\$25
Customer Profit	\$0	\$55	\$55	\$55	\$55	\$55
Probability of being active	100%	70%	49%	34%	24%	17%
Profit expected on average	\$0	\$39	70% Probability: Profit \$55 30% Probability: Profit \$0 Average: \$39 $(=0.7 \cdot 55 + 0.3 \cdot 0)$			

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Fix 1: We have to adjust profits to account for the fact that a customer may become inactive in the future

CUSTOMER VALUE CALCULATION

	Today	Year 1	Year 2	Year 3	Year 4	Year 5
Revenues	\$0	\$200	\$200	\$200	\$200	\$200
Product/Service Costs	\$0	\$120	\$120	\$120	\$120	\$120
Marketing Costs	\$0	\$25	\$25	\$25	\$25	\$25
Customer Profit	\$0	\$55	\$55	\$55	\$55	\$55
Probability of being active	100%	70%	49%	34%	24%	17%
Profit expected on average	\$0	\$39	\$27	49% Probability: Profit \$55 51% Probability: Profit \$0 Average: \$27 $(=0.49 \cdot 55 + 0.51 \cdot 0)$		

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Fix 1: We have to adjust profits to account for the fact that a customer may become inactive in the future

CUSTOMER VALUE CALCULATION

	Today	Year 1	Year 2	Year 3	Year 4	Year 5
Revenues	\$0	\$200	\$200	\$200	\$200	\$200
Product/ Service Costs	\$0	\$120	\$120	\$120	\$120	\$120
Marketing Costs	\$0	\$25	\$25	\$25	\$25	\$25
Customer Profit	\$0	\$55	\$55	\$55	\$55	\$55
Probability of being active	100%	70%	49%	34%	24%	17%
Profit expected on average	\$0	\$39	\$27	\$19	\$13	\$9

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Fix 2: We have to discount profits that arise in the future

CUSTOMER VALUE CALCULATION

	Today	Year 1	Year 2	Year 3	Year 4	Year 5
Revenues	\$0	\$200	\$200	\$200	\$200	\$200
Product/ Service Costs	\$0	\$120	\$120	\$120	\$120	\$120
Marketing Costs	\$0	\$25	\$25	\$25	\$25	\$25
Customer Profit	\$0	\$55	\$55	\$55	\$55	\$55
Probability of being active	100%	70%	49%	34%	24%	17%
Profit expected on average	\$0	\$39	\$27	\$19	\$13	\$9
Present Value of Exp. Profits	\$0					

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DHI discounts future cash flow at 10%

CUSTOMER VALUE CALCULATION

	Today	Year 1	Year 2	Year 3	Year 4	Year 5
Revenues	\$0	\$200	\$200	\$200	\$200	\$200
Product/Service Costs	\$0	\$120	\$120	\$120	\$120	\$120
Marketing Costs	\$0	\$25	\$25	\$25	\$25	\$25
Customer Profit	\$0	\$55	\$55	\$55	\$55	\$55
Probability of being active	100%	70%	49%	34%	24%	17%
Profit expected on average	\$0	\$39	\$27	\$19	\$13	\$9
Present Value of Exp. Profits	\$0	\$35				

10% discount rate:
 $\$39 / 1.1 = \35

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DHI discounts future cash flow at 10%

CUSTOMER VALUE CALCULATION

	Today	Year 1	Year 2	Year 3	Year 4	Year 5
Revenues	\$0	\$200	\$200	\$200	\$200	\$200
Product/Service Costs	\$0	\$120	\$120	\$120	\$120	\$120
Marketing Costs	\$0	\$25	\$25	\$25	\$25	\$25
Customer Profit	\$0	\$55	\$55	\$55	\$55	\$55
Probability of being active	100%	70%	49%	34%	24%	17%
Profit expected on average	\$0	\$39	\$27	\$19	\$13	\$9
Present Value of Exp. Profits	\$0	\$35	\$22			

10% discount rate:
 $\$27 / 1.1 / 1.1 = \22

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DHI discounts future cash flow at 10%

CUSTOMER VALUE CALCULATION

	Today	Year 1	Year 2	Year 3	Year 4	Year 5
Revenues	\$0	\$200	\$200	\$200	\$200	\$200
Product/Service Costs	\$0	\$120	\$120	\$120	\$120	\$120
Marketing Costs	\$0	\$25	\$25	\$25	\$25	\$25
Customer Profit	\$0	\$55	\$55	\$55	\$55	\$55
Probability of being active	100%	70%	49%	34%	24%	17%
Profit expected on average	\$0	\$39	\$27	\$19	\$13	\$9
Present Value of Exp. Profits	\$0	\$35	\$22	\$14	\$9	\$6

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We can now calculate the LTV of a DHI SaverCard customer

CUSTOMER VALUE CALCULATION

	Today	Year 1	Year 2	Year 3	Year 4	Year 5
Revenues	\$0	\$200	\$200	\$200	\$200	\$200
Product/Service Costs	\$0	\$120	\$120	\$120	\$120	\$120
Marketing Costs	\$0	\$25	\$25	\$25	\$25	\$25
Customer Profit	\$0	\$55	\$55	\$55	\$55	\$55
Probability of being active	100%	70%	49%	34%	24%	17%
Profit expected on average	\$0	\$39	\$27	\$19	\$13	\$9
Present Value of Exp. Profits	\$0	\$35	\$22	\$14	\$9	\$6

Customer Lifetime Value (LTV): \$86 (\$35 + \$22 + \$14 + \$9 + \$6)

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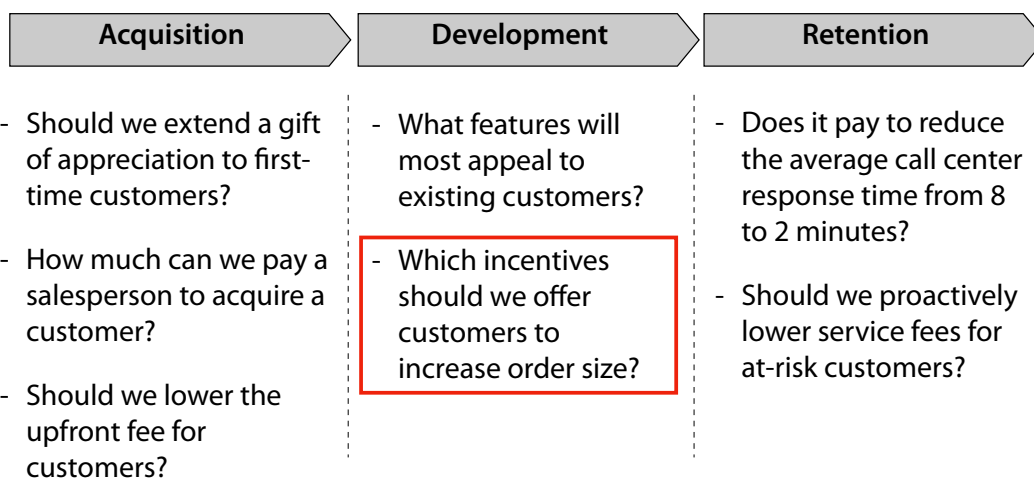
Drivers for improving LTV

- Increased revenue/profit
 - Sales
 - Reduced direct costs
 - Reduced marketing costs
- Reduce churn rate

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Why do we care about the LTV of customers?

TYPICAL USES FOR LTV CALCULATIONS



LTV calculations can become a key tool for *prescriptive analytics*

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Recall the Durham Home Improvement case

EXAMPLE 2: DURHAM HOME IMPROVEMENT

- Durham Home Improvement (DHI) is the chief local competitor to Home Depot specializing in materials for home improvement
- DHI runs a "SaverCard" program where consumers earn credits for free home improvement classes (1 hour per \$200 spent)
- DHI has determined from their customer information file that for the average SaverCard carrier:
 - **Revenue** is \$200 per year
 - **Cost of goods sold** (COGS) is 60% of gross revenue, i.e. \$120 per year
 - **Marketing costs**
 - Cost of attended home improvement seminars is \$25 per year

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The LTV of a DHI SaverCard customer is \$86

CUSTOMER VALUE CALCULATION

	Year 1	Year 2	Year 3	Year 4	Year 5
Revenues	\$200	\$200	\$200	\$200	\$200
Product/Service Costs	\$120	\$120	\$120	\$120	\$120
Marketing Costs	\$25	\$25	\$25	\$25	\$25
Customer Profit	\$55	\$55	\$55	\$55	\$55
Probability of being active	70%	49%	34%	24%	17%
Profit expected on average	\$39	\$27	\$19	\$13	\$9
Present Value of Exp. Profits	\$35	\$22	\$14	\$9	\$6

Customer Lifetime Value (LTV): \$86 (\$35 + \$22 + \$14 + \$9 + \$6)

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DHI is considering a free home delivery program for its SaverCard customers

HOME DELIVERY IDEA FOR DHI

- Heard about success of a home delivery program at industry convention
- Idea:
 - Offer free home delivery for all purchases **above \$150** to SaverCard customers
 - DHI heard presentation by Boston hardware chain at convention that this program **decreased customer churn by 5%** and **increased spending by \$60 per year**
 - Cost of home delivery is **\$30 per occasion**
 - Based on an analysis of average order size DHI estimates that a customer will qualify for home delivery on **average 0.9 times per year**



Should DHI consider offering a free home delivery program for its customers?

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Lets consider the LTV of a SaverCard customer that is offered free home delivery

CUSTOMER VALUE CALCULATION

	Year 1	Year 2	Year 3	Year 4	Year 5
Revenues	\$200	\$200	\$200	\$200	\$200
Product/Service Costs	\$120	\$120	\$120	\$120	\$120
Marketing Costs	\$25	\$25	\$25	\$25	\$25
Customer Profit	\$55	\$55	\$55	\$55	\$55
Probability of being active	70%	49%	34%	24%	17%
Profit expected on average	\$39	\$27	\$19	\$13	\$9
Present Value of Exp. Profits	\$35	\$22	\$14	\$9	\$6

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Lets consider the LTV of a SaverCard customer that is offered free home delivery

CUSTOMER VALUE CALCULATION

	Year 1	Year 2	Year 3	Year 4	Year 5
Revenues	\$200	\$200	\$200	\$200	\$200
Product/Service Costs	\$120	\$120	\$120	\$120	\$120
Marketing Costs	\$25	\$25	\$25	\$25	\$25
Customer Profit	\$55	\$55	\$55	\$55	\$55
Probability of being active	70%	49%	34%	24%	17%
Profit expected on average	\$39	\$27	\$19	\$13	\$9
Present Value of Exp. Profits	\$35	\$22	\$14	\$9	\$6

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Revenue are expected to change from \$200 to \$260

CUSTOMER VALUE CALCULATION

	Year 1	Year 2	Year 3	Year 4	Year 5
Revenues	\$260	\$260	\$260	\$260	\$260
Product/Service Costs	\$120	\$120	\$120	\$120	\$120
Marketing Costs	\$25	\$25	\$25	\$25	\$25
Customer Profit	\$115	\$115	\$115	\$115	\$115
Probability of being active	70%	49%	34%	24%	17%
Profit expected on average	\$81	\$56	\$39	\$28	\$19
Present Value of Exp. Profits	\$73	\$47	\$30	\$19	\$12

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Revenue are expected to change from \$200 to \$260

CUSTOMER VALUE CALCULATION

	Year 1	Year 2	Year 3	Year 4	Year 5
Revenues	\$260	\$260	\$260	\$260	\$260
Product/Service Costs	\$120	\$120	\$120	\$120	\$120
Marketing Costs	\$25	\$25	\$25	\$25	\$25
Customer Profit	\$115	\$115	\$115	\$115	\$115
Probability of being active	70%	49%	34%	24%	17%
Profit expected on average	\$81	\$56	\$39	\$28	\$19
Present Value of Exp. Profits	\$73	\$47	\$30	\$19	\$12

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Cost are 60% of revenues, so they will change as well

CUSTOMER VALUE CALCULATION

	Year 1	Year 2	Year 3	Year 4	Year 5
Revenues	\$260	\$260	\$260	\$260	\$260
Product/Service Costs	\$156	\$156	\$156	\$156	\$156
Marketing Costs	\$25	\$25	\$25	\$25	\$25
Customer Profit	\$79	\$79	\$79	\$79	\$79
Probability of being active	70%	49%	34%	24%	17%
Profit expected on average	\$55	\$39	\$27	\$19	\$13
Present Value of Exp. Profits	\$50	\$32	\$20	\$13	\$8

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What about marketing costs?

CUSTOMER VALUE CALCULATION

	Year 1	Year 2	Year 3	Year 4	Year 5
Revenues	\$260	\$260	\$260	\$260	\$260
Product/Service Costs	\$156	\$156	\$156	\$156	\$156
Marketing Costs	\$25	\$25	\$25	\$25	\$25
Customer Profit	\$79	\$79	\$79	\$79	\$79
Probability of being active	70%	49%	34%	24%	17%
Profit expected on average	\$55	\$39	\$27	\$19	\$13
Present Value of Exp. Profits	\$50	\$32	\$20	\$13	\$8

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At \$30 per delivery and 90% chance of a delivery per year, marketing costs are expected to rise by \$27

CUSTOMER VALUE CALCULATION

	Year 1	Year 2	Year 3	Year 4	Year 5
Revenues	\$260	\$260	\$260	\$260	\$260
Product/Service Costs	\$156	\$156	\$156	\$156	\$156
Marketing Costs	\$52	\$52	\$52	\$52	\$52
Customer Profit	\$52	\$52	\$52	\$52	\$52
Probability of being active	70%	49%	34%	24%	17%
Profit expected on average	\$36	\$25	\$18	\$12	\$9
Present Value of Exp. Profits	\$33	\$21	\$13	\$9	\$5

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Finally, what about customer churn?

CUSTOMER VALUE CALCULATION

	Year 1	Year 2	Year 3	Year 4	Year 5
Revenues	\$260	\$260	\$260	\$260	\$260
Product/Service Costs	\$156	\$156	\$156	\$156	\$156
Marketing Costs	\$52	\$52	\$52	\$52	\$52
Customer Profit	\$52	\$52	\$52	\$52	\$52
Probability of being active	70%	49%	34%	24%	17%
Profit expected on average	\$36	\$25	\$18	\$12	\$9
Present Value of Exp. Profits	\$33	\$21	\$13	\$9	\$5

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DHI expects churn to decrease from 30% per year to 25% per year

CUSTOMER VALUE CALCULATION

	Year 1	Year 2	Year 3	Year 4	Year 5
Revenues	\$260	\$260	\$260	\$260	\$260
Product/Service Costs	\$156	\$156	\$156	\$156	\$156
Marketing Costs	\$52	\$52	\$52	\$52	\$52
Customer Profit	\$52	\$52	\$52	\$52	\$52
Probability of being active	75%	56%	42%	32%	24%
Profit expected on average	\$39	\$29	\$22	\$16	\$12
Present Value of Exp. Profits	\$35	\$24	\$16	\$11	\$8

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We can now calculate the new LTV

CUSTOMER VALUE CALCULATION

	Year 1	Year 2	Year 3	Year 4	Year 5
Revenues	\$260	\$260	\$260	\$260	\$260
Product/Service Costs	\$156	\$156	\$156	\$156	\$156
Marketing Costs	\$52	\$52	\$52	\$52	\$52
Customer Profit	\$52	\$52	\$52	\$52	\$52
Probability of being active	75%	56%	42%	32%	24%
Profit expected on average	\$39	\$29	\$22	\$16	\$12
Present Value of Exp. Profits	\$35	\$24	\$16	\$11	\$8

LTV with home delivery program: \$94 ($\$35 + \$24 + \$16 + \$11 + \8)

Current LTV: \$86 ($\$35 + \$22 + \$14 + \$9 + \6)

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The home delivery program might be worth the expense

HOME DELIVERY ECONOMICS

- Increases cost of SaverCard program from \$25 to \$52
- Increases revenue per active customer from \$200 to \$260
- Decreases profit per active customer from \$55 to \$52
- However, has positive effect on customer churn: from 30% to 25%

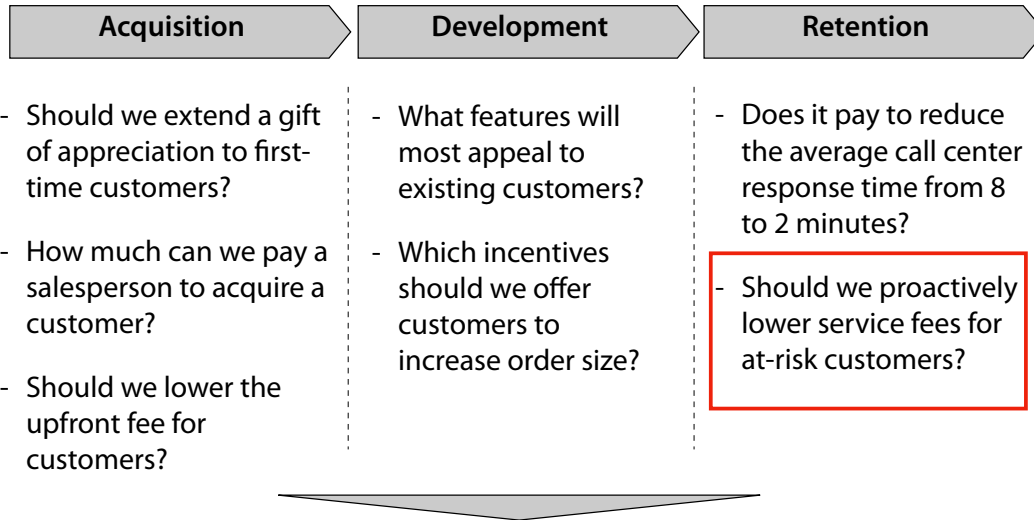


The decrease in customer churn makes up for lower profits per active customer
Implementation will depend on fixed cost of administering program

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Why do we care about the LTV of customers?

TYPICAL USES FOR LTV CALCULATIONS



LTV calculations can become a key tool for *prescriptive analytics*

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Consider a video streaming company

EXAMPLE 3: Video Streaming Company

- Major video streaming provider
- 20 million subscribers by 2017
- High recurrent revenue
- On average, revenue sharing with movie studios is \$0.05 per streaming incident of 1/10 video length.

Standard (\$13/month)	<ul style="list-style-type: none">• Watch on 2 devices at a time• Watch in 1080p (Full HD)• Download on 2 supported devices at a time
Premium (\$16/month)	<ul style="list-style-type: none">• Watch on 4 devices at a time• Watch in 1080p (Full HD)• Download on 6 supported devices at a time

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The premium membership plan has a more profitable unit economics ($0.05c * 20 = \$1$)

PLAN POPULARITY AND USAGE

Plan	Monthly Price (\$)	Customer Perc.	Avg. Mon. Streams	Avg. Churn Rate
Standard	13	60%	100	8%
Premium	16	40%	120	10%

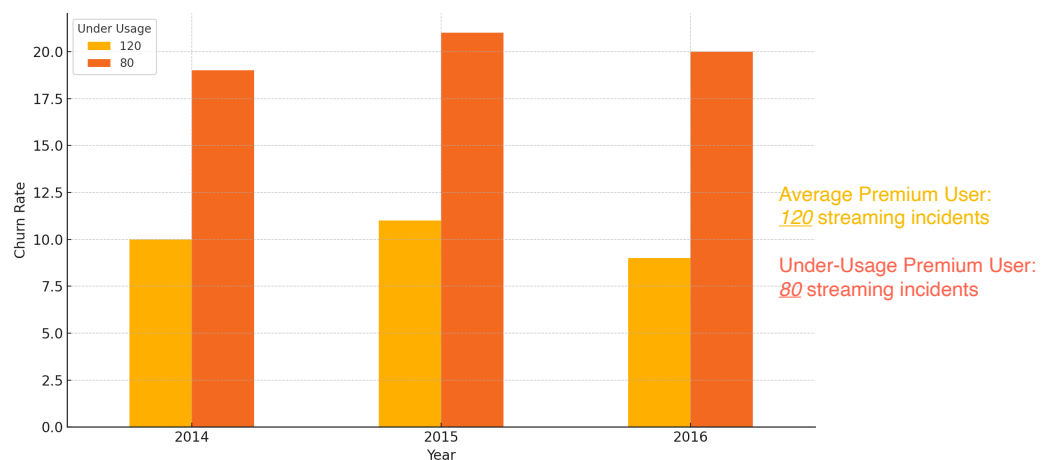
OVERALL CHURN PROBLEM

- Churn rate is on average 9% per year (differ by plans)
- After 6 years, 1/2 of a cohort would have churned

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The customer service team makes an interesting discovery for the premium plan subscribers

CHURN RATES BY PREMIUM CUSTOMER BEHAVIOR



Should we proactively downgrade low-usage premium customers to the standard plan (average usage is 100 streaming incidents)?

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The company needs to collect some information before a LTV calculation is possible

FACT DISCOVERY FOR DOWNGRADING TEST

- Questions and answers:

- Monthly revenue loss from downgrading? **\$3**
- What will the churn rate of customers be after the downgrade?
 - 20% for at-risk group
 - 8% for current standard plan subscribers
 - Is it realistic to assume 8%? Usage is even lower than the standard plan
 - Do sensitivity analysis: How much does churn have to fall to make this retention initiative work?

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We can now calculate the new LTV

LTV FOR AT-RISK GROUP: STATUS QUO

	Year 1	Year 2	Year 3	Year 4	Year 5
Revenues	\$192	\$16/month *12		\$192	\$192
Product/Service Costs	\$48	\$48	\$48	\$48	\$48
Marketing Costs	\$0	\$0	\$0	\$0	\$0
Customer Profit	\$144	\$144	\$144	\$144	\$144
Probability of being active	80%	64%	51%	41%	33%
Profit expected on average	\$115	\$92	\$74	\$59	\$47
Present Value of Exp. Profits	\$105	\$76	\$55	\$40	\$29

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We can now calculate the new LTV

LTV FOR AT-RISK GROUP: STATUS QUO

	Year 1	Year 2	Year 3	Year 4	Year 5
Revenues	\$192	\$192	\$192	\$192	\$192
Product/Service Costs	\$48	\$48	\$48	\$48	\$48
Marketing Costs	\$0	\$0	\$0	\$0	\$0
Customer Profit	\$144	\$144	\$144	\$144	\$144
Probability of being active	80%	64%	51%	41%	33%
Profit expected on average	\$115	\$92	\$74	\$59	\$47
Present Value of Exp. Profits	\$105	\$76	\$55	\$40	\$29

80 inc. /month
*12 months
\$0.05/inc.

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We can now calculate the new LTV

LTV AFTER DOWNGRADE

	Year 1	Year 2	Year 3	Year 4	Year 5
Revenues	\$192	\$192	\$192	\$192	\$192
Product/Service Costs	\$48	\$48	\$48	\$48	\$48
Marketing Costs	\$0	\$0	\$0	\$0	\$0
Customer Profit	\$144	\$144	\$144	\$144	\$144
Probability of being active	80%	64%	51%	41%	33%
Profit expected on average	\$115	\$92	\$74	\$59	\$47
Present Value of Exp. Profits	\$105	\$76	\$55	\$40	\$29

20% churn rate

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We can now calculate the new LTV

LTV FOR AT-RISK GROUP: STATUS QUO

	Year 1	Year 2	Year 3	Year 4	Year 5
Revenues	\$192	\$192	\$192	\$192	\$192
Product/Service Costs	\$48	\$48	\$48	\$48	\$48
Marketing Costs	\$0	\$0	\$0	\$0	\$0
Customer Profit	\$144	\$144	\$144	\$144	\$144
Probability of being active	80%	64%	51%	41%	33%
Profit expected on average	\$115	\$92	\$74	\$59	\$47
Present Value of Exp. Profits	\$105	\$76	\$55	\$40	\$29

LTV Status quo: \$306

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We can now calculate the new LTV

LTV AFTER DOWNGRADE: Optimistic Churn Rate 8%

	Year 1	Year 2	Year 3	Year 4	Year 5
Revenues	\$156			\$156	\$156
Product/Service Costs	\$48			\$48	\$48
Marketing Costs	\$0	\$0	\$0	\$0	\$0
Customer Profit	\$108	\$108	\$108	\$108	\$108
Probability of being active	92%	85%	78%	72%	66%
Profit expected on average	\$99	\$91	\$84	\$77	\$71
Present Value of Exp. Profits	\$90	\$76	\$63	\$53	\$44

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We can now calculate the new LTV

LTV AFTER DOWNGRADE: Optimistic Churn Rate 8%

	Year 1	Year 2	Year 3	Year 4	Year 5
Revenues	\$156	\$156	\$156	\$156	\$156
Product/Service Costs	\$48	\$48	\$48	\$48	\$48
Marketing Costs	\$0	\$0	\$0	\$0	\$0
Customer Profit	\$108	\$108	\$108	\$108	\$108
Probability of being active	92%	85%	78%	72%	66%
Profit expected on average	\$99	\$91	\$84	\$77	\$71
Present Value of Exp. Profits	\$90	\$76	\$63	\$53	\$44

80 inc. /month
*12 months
\$0.05/inc.

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We can now calculate the new LTV

LTV AFTER DOWNGRADE: Optimistic Churn Rate 8%

	Year 1	Year 2	Year 3	Year 4	Year 5
Revenues	\$156	\$156	\$156	\$156	\$156
Product/Service Costs	\$48	\$48	\$48	\$48	\$48
Marketing Costs	\$0	\$0	\$0	\$0	\$0
Customer Profit	\$108	\$108	\$108	\$108	\$108
Probability of being active	92%	85%	78%	72%	66%
Profit expected on average	\$99	\$91	\$84	\$77	\$71
Present Value of Exp. Profits	\$90	\$76	\$63	\$53	\$44

8% churn rate

New LTV \$326 > Status quo \$306

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We can now calculate the break-even churn rate that “equalize” the new and status LTVs

LTV AFTER DOWNGRADE: Break-even Churn Rate 10%

	Year 1	Year 2	Year 3	Year 4	Year 5
Revenues	\$156	\$156	\$156	\$156	\$156
Product/Service Costs	\$48	\$48	\$48	\$48	\$48
Marketing Costs	\$0	Need 10% churn rate or less (down from 20%)		\$0	\$0
Customer Profit	\$108			\$108	\$108
Probability of being active	90%	81%	72%	65%	58%
Profit expected on average	\$97	\$87	\$78	\$70	\$63
Present Value of Exp. Profits	\$88	\$72	\$59	\$48	\$39

At what churn rate, New LTV \$306 = Status quo \$306?

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Calculating LTVs requires two important decisions

LTV DECISIONS

- How far into the future should we calculate the LTV?
 - 3-5 years typical, depends on industry
 - Depends on inter-purchase time (auto vs. cell-phone)
 - Depends on churn rate and interest rate
 - Depends on confidence to predict far out
- What cost should we account for in the LTV?
 - Does the cost change between the two scenarios?
 - E.g., Acquisition decision: need to include acquisition cost
 - E.g., The cost associated with the alternative strategy (but not for the “status quo”)

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“Year 1” in the LTV calculation need not be “Year 1” in the customer’s life (E.g., calculating 5-year LTV for customers signed up 2 years ago)

Time for LTV calculation	Start of LTV Calc.	Year 1 (e.g. 2017)	Year 2 (e.g. 2018)	Year 3 (e.g. 2019)	Year 4 (e.g. 2020)	Year 5 (e.g. 2021)
Revenue		R2017	R2018	R2019	R2020	R2021
...	
Profit		P2017	P2018	P2019	P2020	P2021
Churn rate		20%	28%	22%	28%	22%
Prob. of being active at end of period	100%	80%	58%	45%	32%	25%

Time in customer's life	Sign-up	Year 1 (e.g. 2015)	Year 2 (e.g. 2016)	Year 3 (e.g. 2017)	Year 4 (e.g. 2018)	...
Revenue	R0	R2015	R2016	R2017	R2018	...
...
Profit	P0	P2015	P2016	P2017	P2018	...
Churn rate		30%	25%	20%	28%	...