

Introduction to Marketing Analytics

What is Marketing?

Professor Ricardo Montoya

Outline

- What is Marketing about?
 - Discussion of one mini case: Segway HT
 - Marketing framework
 - Example of predictive modeling
- What will we cover in class?
 - Course objectives and structure
- What do I expect from you?
 - Course logistics

Motivation - Netflix

- Online entertainment subscription service
- World's largest subscription service streaming movies and TV episodes over the Internet
- More than 209 million memberships in over 190 countries (2021)
- Market cap on August 6, 2021 was US\$230.22b
 - August 4, 2020 was US\$224.76 b (increase of 2%)

Motivation - Netflix

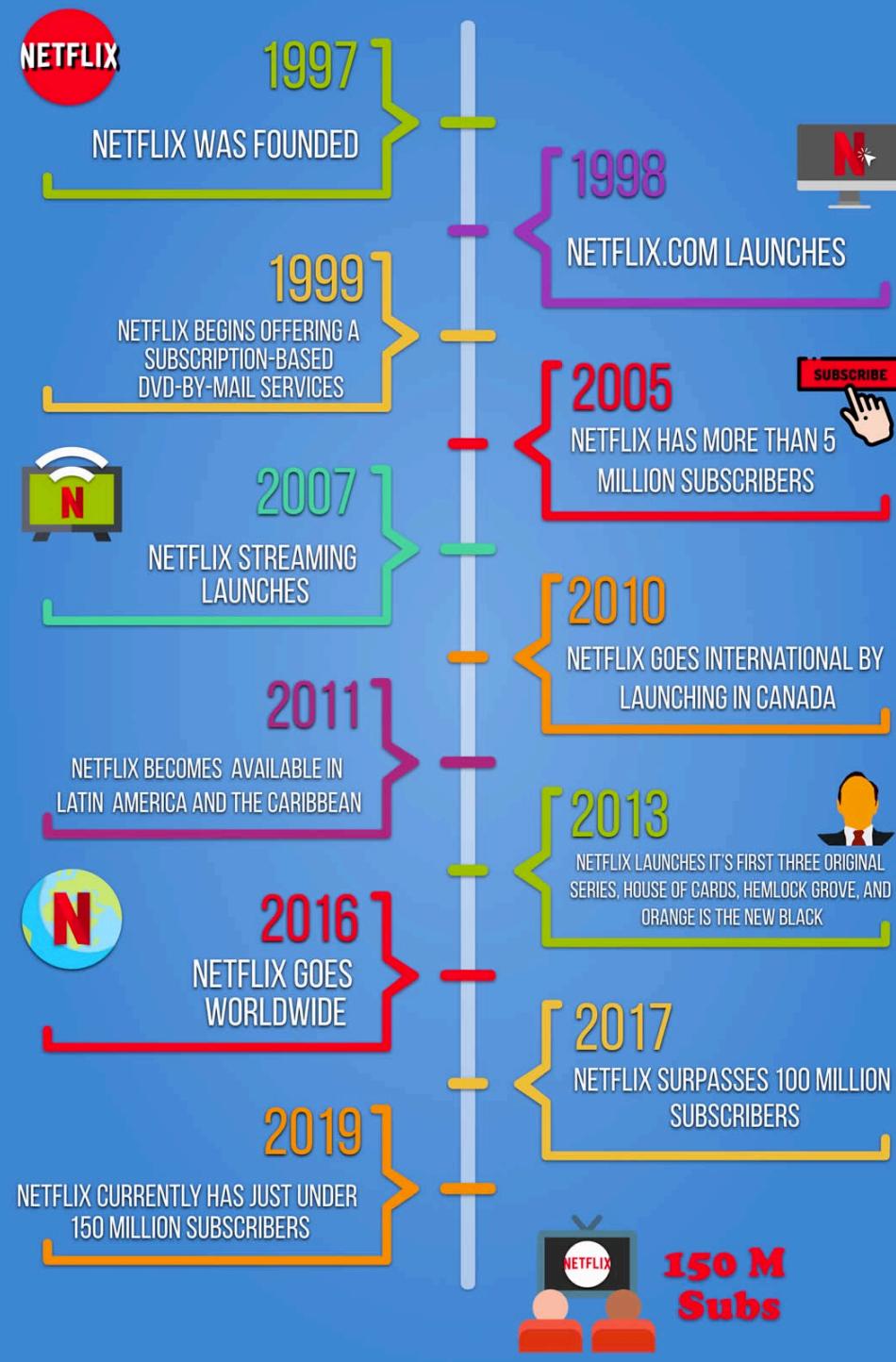
The screenshot shows the Netflix homepage with a dark theme. At the top, there's a navigation bar with the Netflix logo, a search icon, a bell icon, and a user profile for "Joshua". Below the header, the page is divided into several sections:

- Top Picks for Joshua:** A row of five show thumbnails: "Breaking Bad", "SING", "The Fosters", "New Girl", and "are you here".
- Trending Now:** A row of six show thumbnails: "shameless", "Schitt's Creek", "ORANGE IS THE NEW BLACK", "OZARK", "New Girl", and "STRANGER THINGS".
- Because you watched Narcos:** A row of five show thumbnails: "SURVIVING ESCOBAR ALIAS JJ", "GOMORRAH", "PABLO ESCOBAR EL PATRÓN DEL MAL", "SUBURRA BLOOD ON ROME", and "ALIAS JJ, LA CELEBRIDAD DEL MAL".
- New Releases:** A row of five show thumbnails: "BEYOND STRANGER THINGS", "Moana", "THE MIST", "THE BABYSITTER", and "RIVERDALE".



UNIVERSIDAD
TORCUATO DI TELLA

Netflix Timeline



Still growing but at smaller rate

Netflix Market Cap: **230.25B** for Aug. 6, 2021

[View 4,000+ financial data types](#)

Market Cap Chart

[View Full Chart](#)

[1d](#) [5d](#) [1m](#) [3m](#) [6m](#) [YTD](#) [1y](#) [5y](#) [10y](#) [Max](#)

[Export Data](#) [Save Image](#) [Print Image](#)

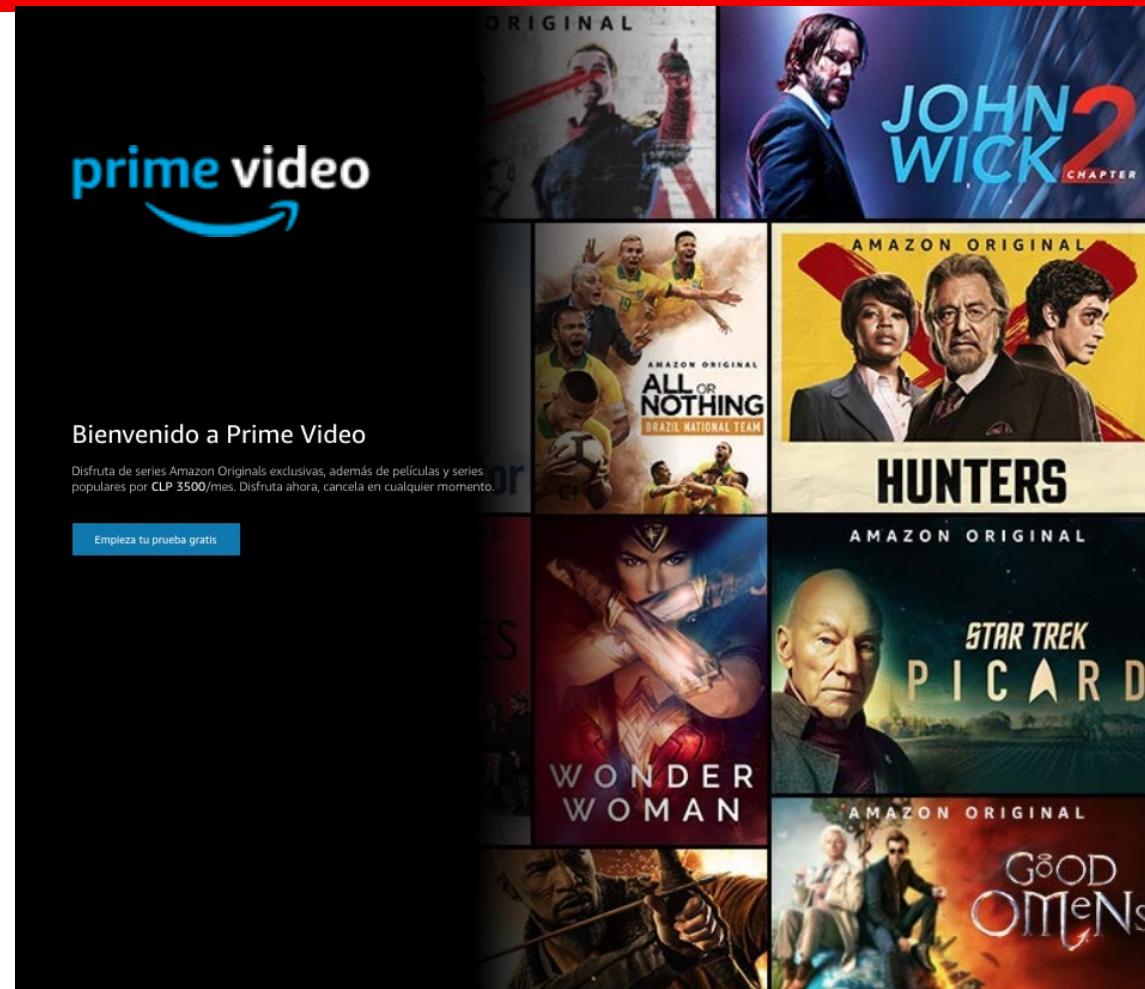


Netflix's Market Intelligence tools

- Quantitative and qualitative approaches
 - Primary surveys
 - Site user testing (A/B), adv testing
 - Statistics and data mining
 - Brand awareness studies
 - Subscriber satisfaction
 - Marketing mix optimization
 - Segmentation research
 - Platform analysis

**What is the
product/service
Netflix is selling?**

Stronger Competitors



Ver en cualquier parte

Disfruta desde la web o con la aplicación de Prime Video en tu teléfono, tablet o ciertos Smart TV en hasta 3 dispositivos al mismo tiempo.



Descarga y disfruta

Disfruta de contenido sin conexión con la aplicación Prime Video cuando descargas títulos en tu iPhone, iPad, tablet o dispositivo Android.



Ahorro de datos

Controla el uso de datos mientras descargas y ves videos en ciertos teléfonos y tablets.

New Players



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Other companies using market intelligence

- Tesco loyalty club
- Improve customer knowledge
- Capital One
 - Many experiments are run frequently to improve customer experience (acquisition and retention; up-selling and cross-selling)



Companies Using Market Intelligence

Analytic competitors are found in a variety of industries

Consumer products

- Anheuser-Busch
- E. & J. Gallo Winery
- Mars
- Procter & Gamble

Financial services

- Barclays Bank
- Capital One
- Royal Bank of Canada
- Progressive Casualty Insurance
- WellPoint

Hospitality and entertainment

- Oakland A's
- Boston Red Sox
- Harrah's Entertainment
- Marriott International
- New England Patriots

Industrial products

- CEMEX
- John Deere & Company

Pharmaceuticals

- AstraZeneca
- Solvay
- Vertex Pharmaceuticals, Inc.

Retail

- Amazon.com
- JCPenny
- Tesco
- Wal-Mart

Telecommunications

- Sprint
- O2
- Bouygues Telecom

Transport

- FedEx
- Schneider National
- United Parcel Service

eCommerce

- Google
- Netflix, Inc.
- Yahoo!

Competing on analytics. Davenport and Harris 2007



BACK TO
BASICS

What is Marketing?

- To achieve organizational (company) goals by determining the needs and wants of customers and delivering the desired benefits more effectively and efficiently than competitors

What is Marketing? (Executives' Views)

“Everything starts with the customer.”

~ Lou Gerstner,
CEO of IBM (1993-2002)

“Creating shareholder wealth is not the purpose of the business. It is the reward for creating customer value.”

~ Michael Tracy and Fred Wiersema in **CFO Magazine**

“My own biggest mistake in the last 20 years was that sometimes I designed solutions for problems that people didn't yet know they had. That's why some of the things that could've made a difference couldn't find a market.”

~ Bill Joy, the ‘Edison of the Internet’



New Economy & New World

- Think about your digital strategy
 - Reimagine your business
 - Reevaluate your value chain
 - Reconnect with customers
 - Rebuild your organization



weather.com





Corporate
strategy

Digital
strategy

Corporate
strategy

Digital
strategy

Corporate
strategy

Digital
strategy

Strategy

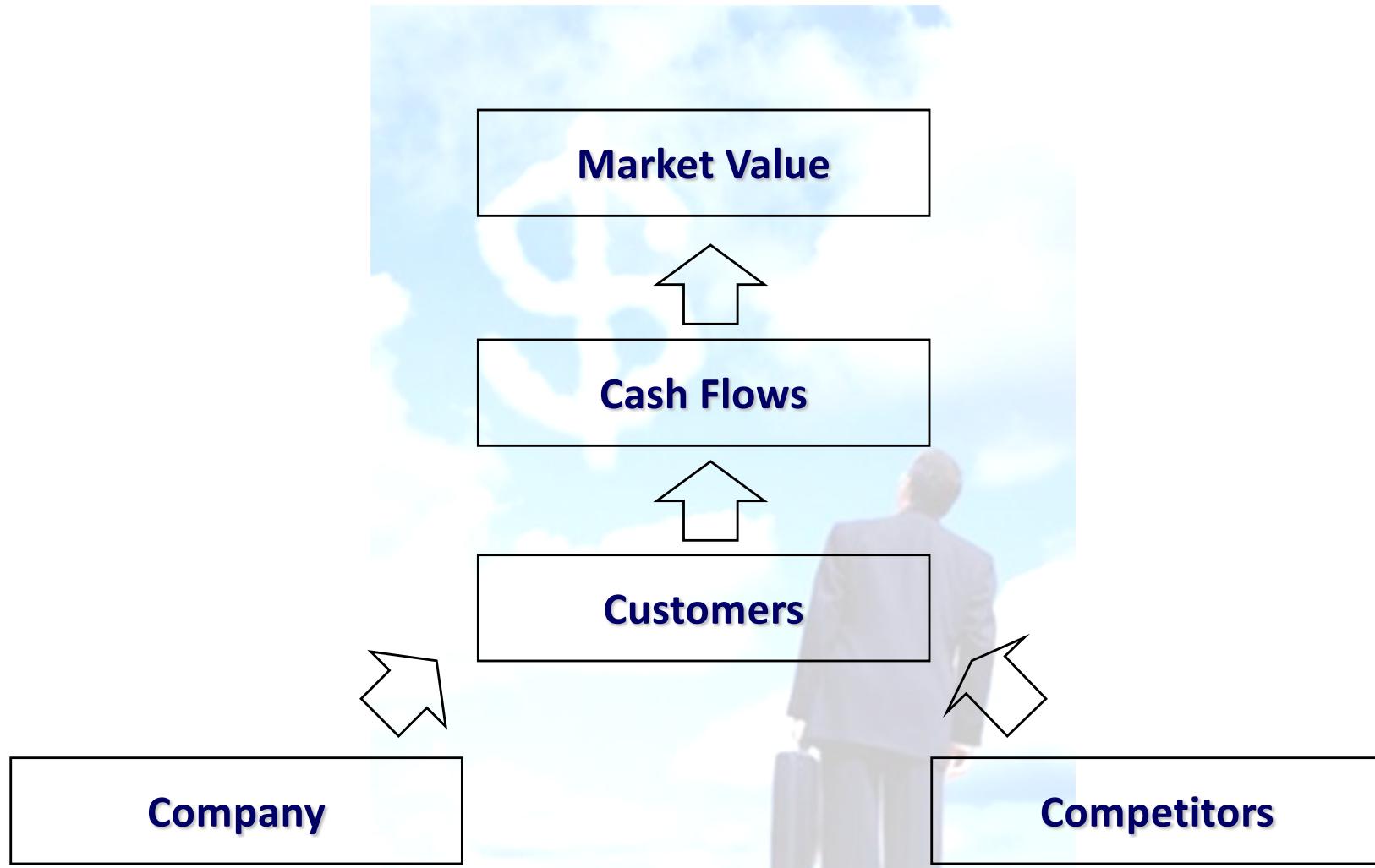
2000

2008

2015

2020

Marketing and Firm Value



What Kinds of Things are Marketed?

- Products:
 - Cars, Soft drinks
- Services:
 - Hotels, Vehicle Repair and Maintenance
- Organizations:
 - Post office, United Nations
- Ideas
 - Democracy
- Values
 - Behavior



Creating Value





© Jon Hicks/Corbis

TORCUATO DI TELLA

Mini Case: Segway HT



Segway HT

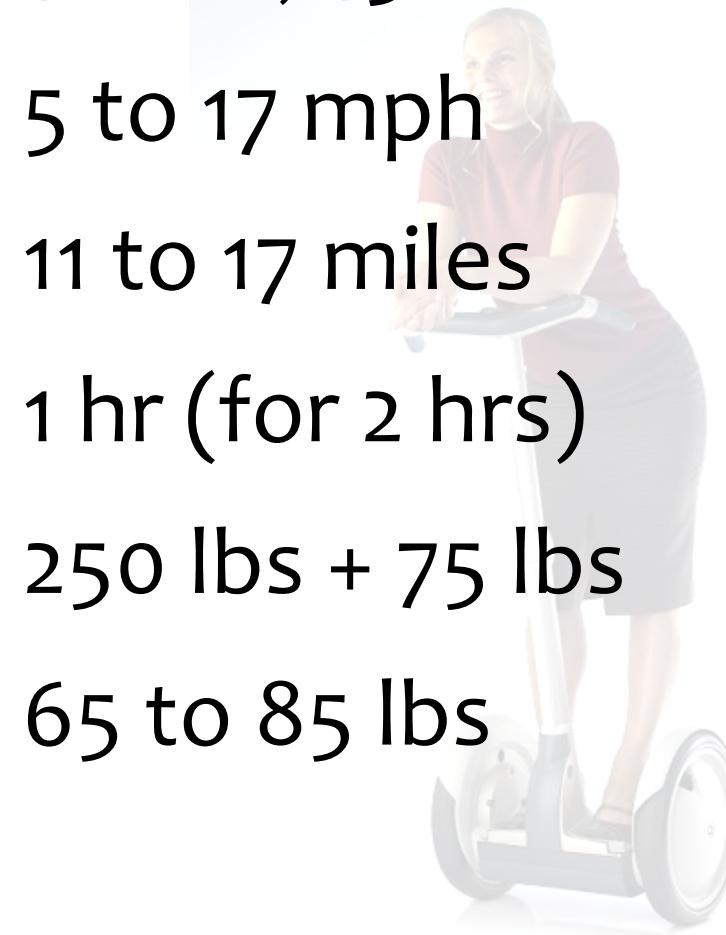
- “Solution to short-distance travel” and expected to replace cars for short trips
- Battery-charged motors propel upright riders more quickly than walking
- No accelerator or brakes; uses only human balance for movement in all directions



Segway HT Specifications



- Price: \$8000, \$3000
- Maximum speed: 5 to 17 mph
- Range: 11 to 17 miles
- Recharge time: 1 hr (for 2 hrs)
- Payload: 250 lbs + 75 lbs
- Weight: 65 to 85 lbs

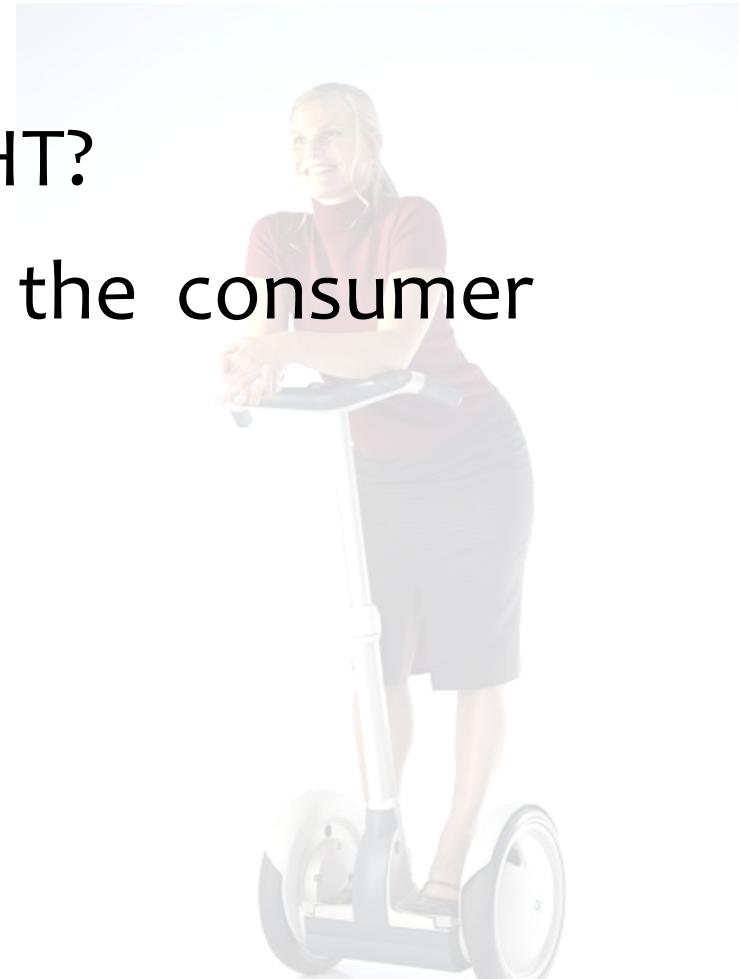
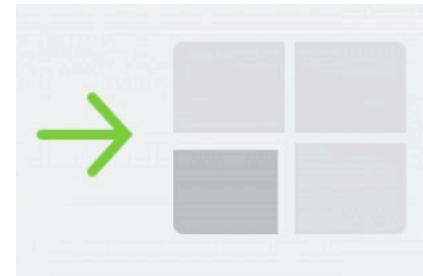


Marketing Strategy for Segway HT



What is the role of Marketing?

- ... in developing the Segway HT?
- ... in launching the product to the consumer market in late 2002?



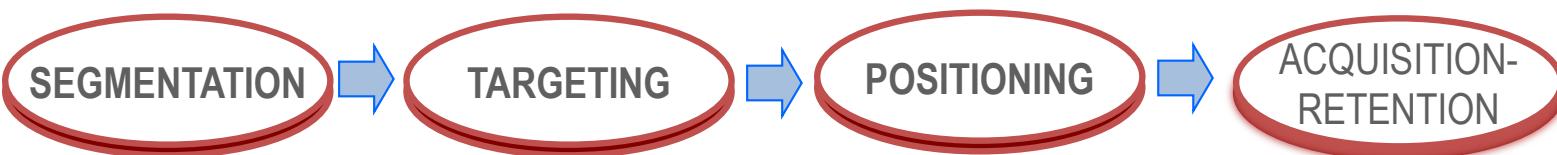
Organizing Structure for Marketing Management

What To Do?

**Identify Market Opportunities
(the 3Cs)**

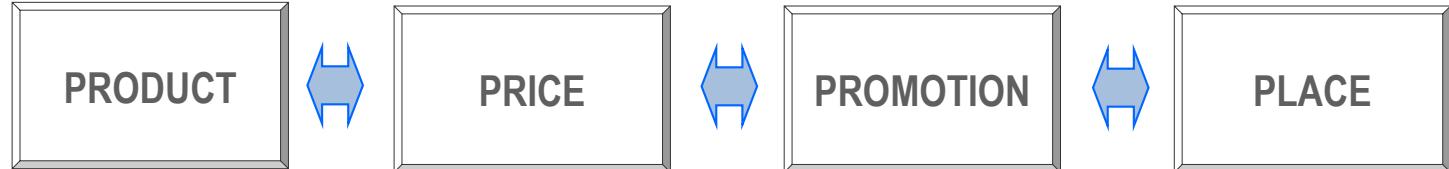


Set Strategy (STP)



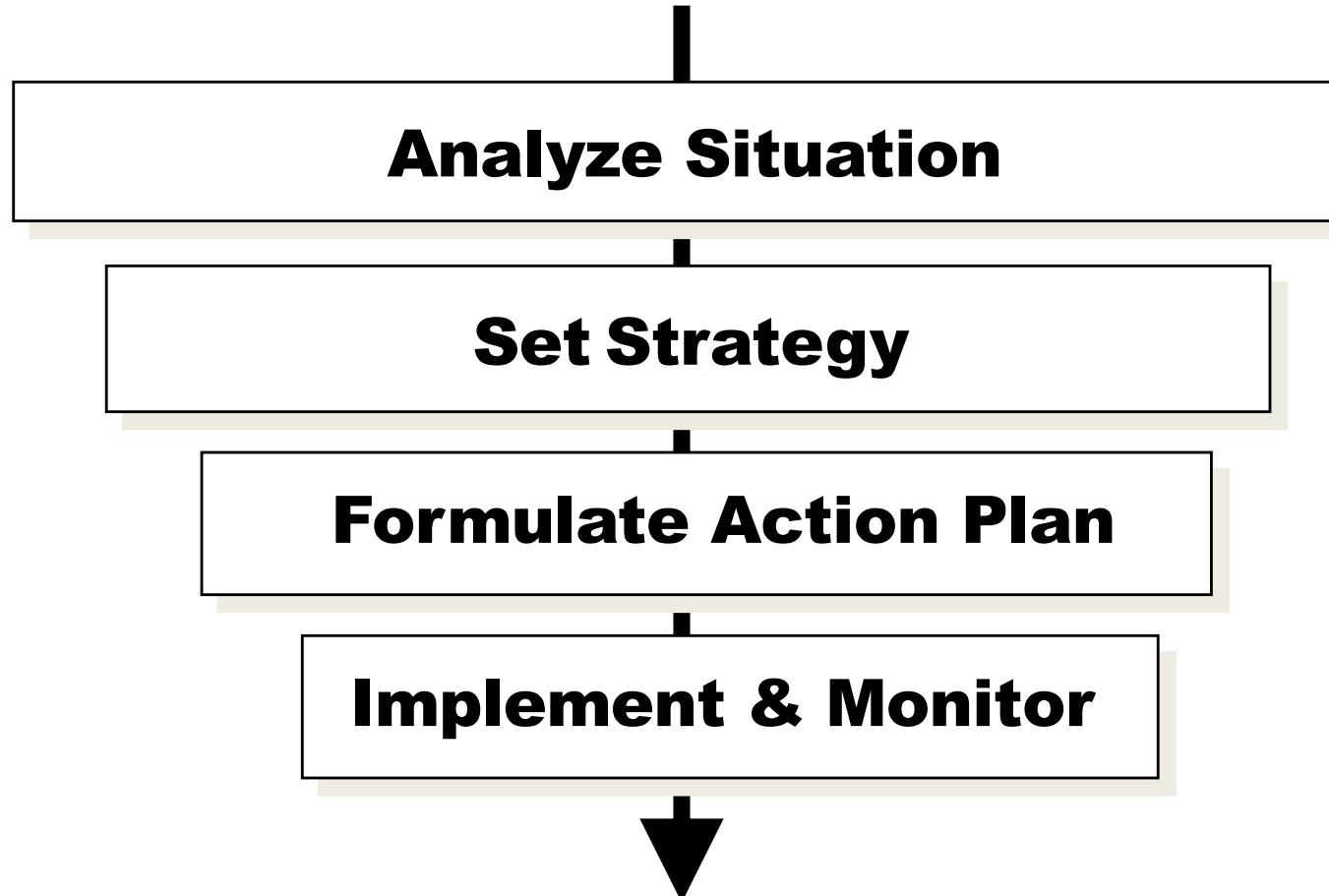
How To Do It?

**Formulate Marketing Program
(the 4Ps)**



Begin with a Process

- The **marketing** process consists of **four** steps:



1. Analyze Situation (the 3Cs)



- Customer analysis
 - understand the basis for an exchange of value (customer need, company capabilities)
- Company analysis
 - capabilities (strengths, weaknesses), goals, economics
- Competition analysis
 - how do we sustain this exchange in a competitive marketplace? (points of difference, distinctive competencies)

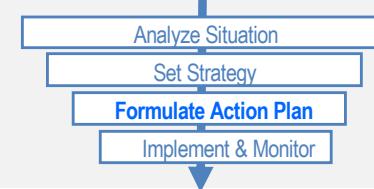
2. Set Strategy



- **Segmentation**
 - Describe customer heterogeneity
- **Targeting**
 - Choose customers to serve
- **Positioning**
 - Identify key benefits, points of difference



3. Formulate Action Plan



Organized along two dimensions:

- **Marketing mix (the 4Ps)**
 - basic activities in delivering value to customers
- **Product life cycle**
 - describes market context (state of customer knowledge, nature of competition)

Marketing Mix



The elements of the **marketing mix**
correspond to the basic activities in
delivering value to customers

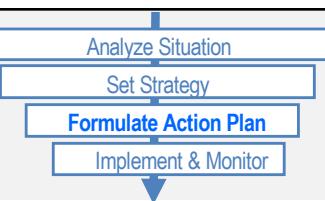
BASIC ACTIVITY

- Create / Produce
- Deliver
- Communicate
- Capture

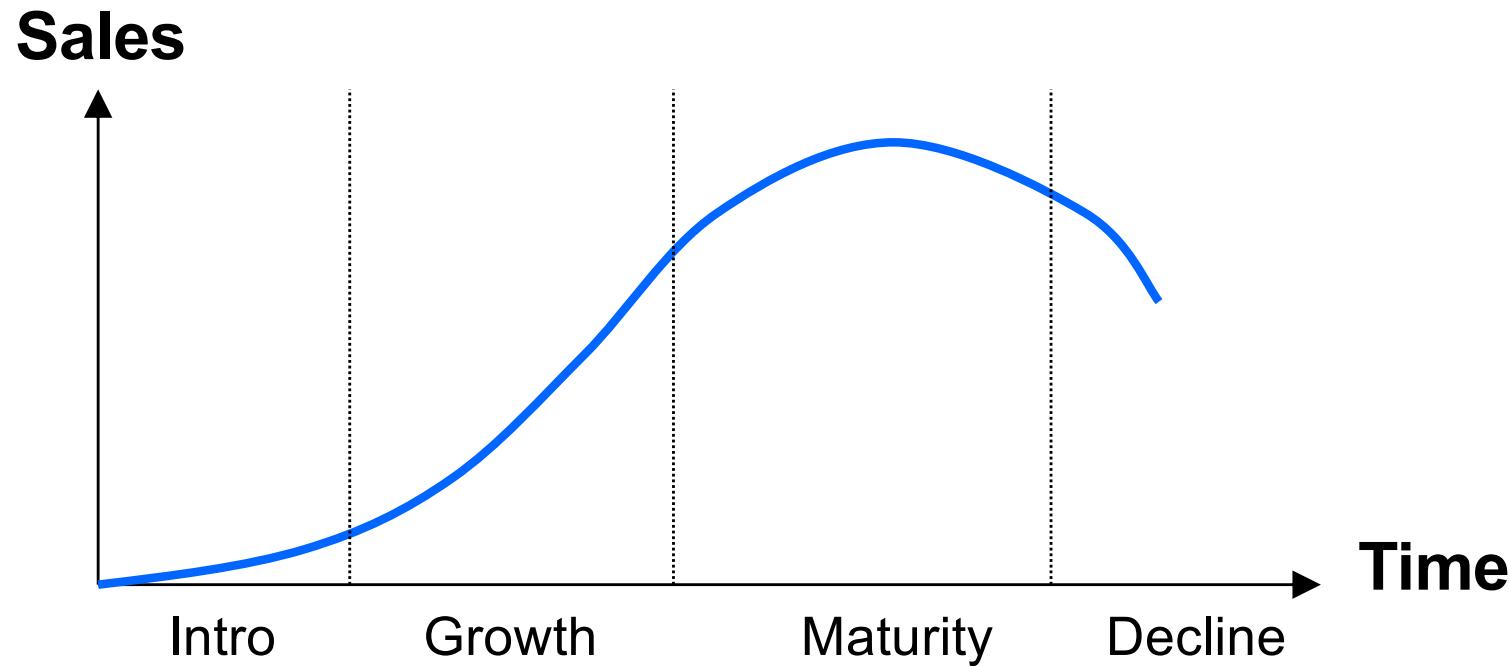
MIX ELEMENT

- Product
- Distribution
- Promotion
- Price

Product Life Cycle



The stages of the **product life cycle** summarize the state of customer knowledge and the nature of competition



Analyze Situation

Set Strategy

Formulate Action Plan

Implement & Monitor

3. Formulate Action Plan

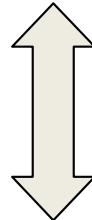
Product

Place

Price

Promotion

Early life
cycle



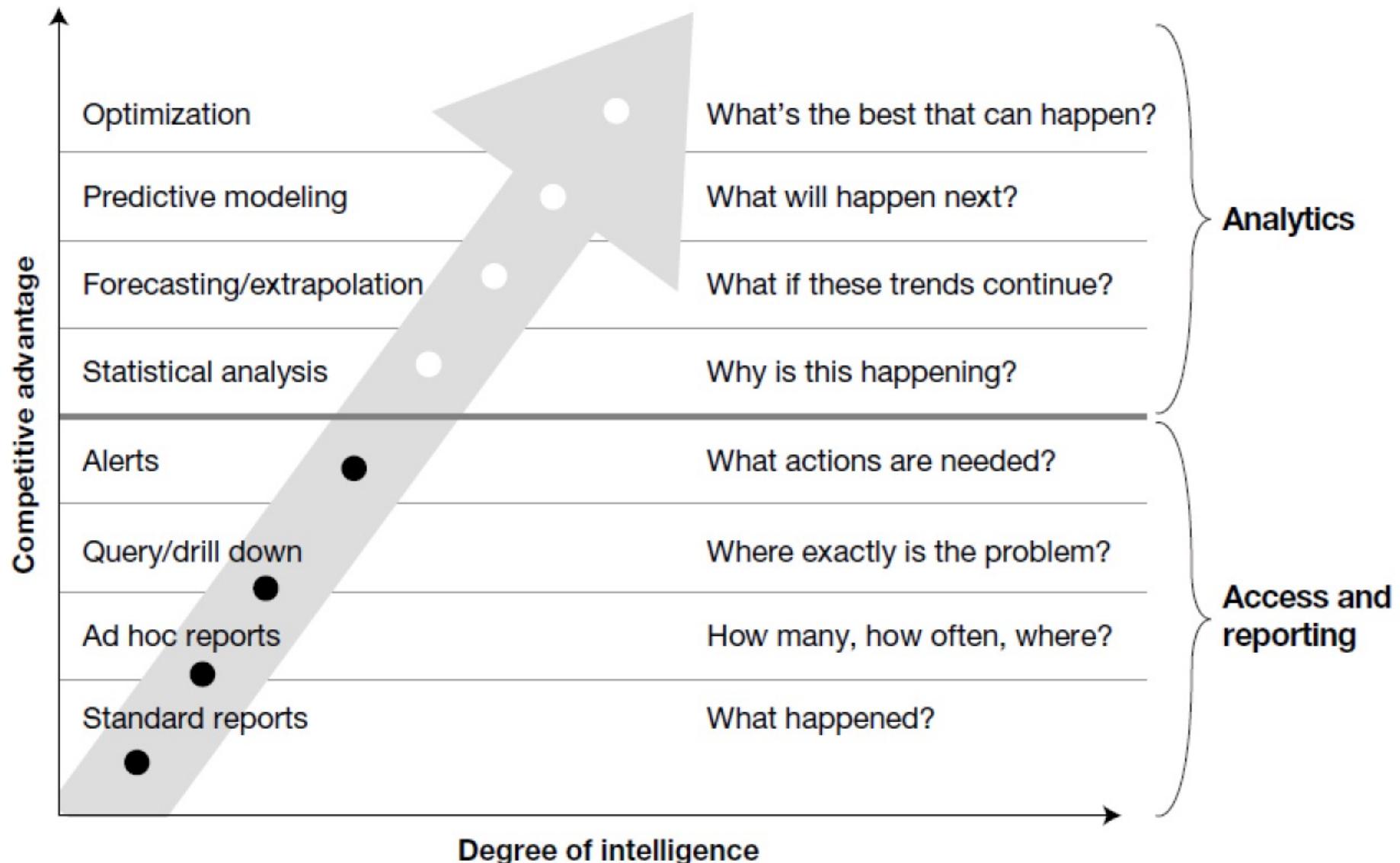
Late life cycle

4. Implement and Monitor



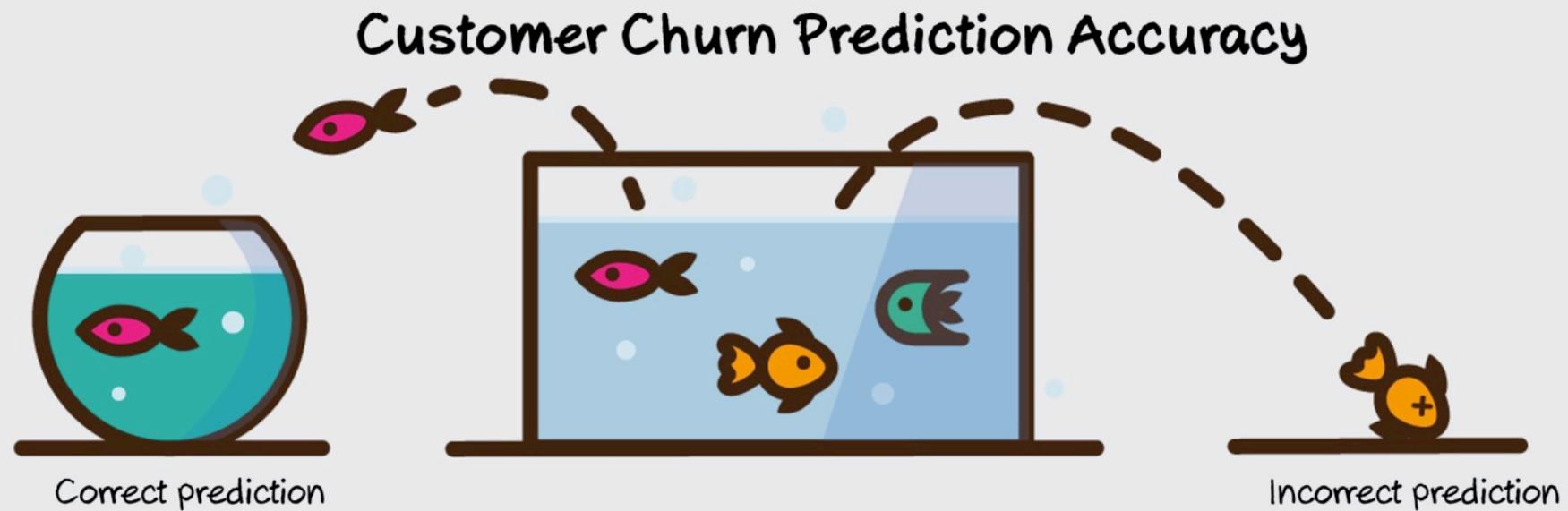
- Marketing organization
 - How should we deploy resources in support of the plan?
- Tracking performance
 - Are we on target?

Successful Marketing Plan & Customer Analytics



Example Churn Prediction

- Context & Business Problem
- Methodology
- Results
- Business Insights

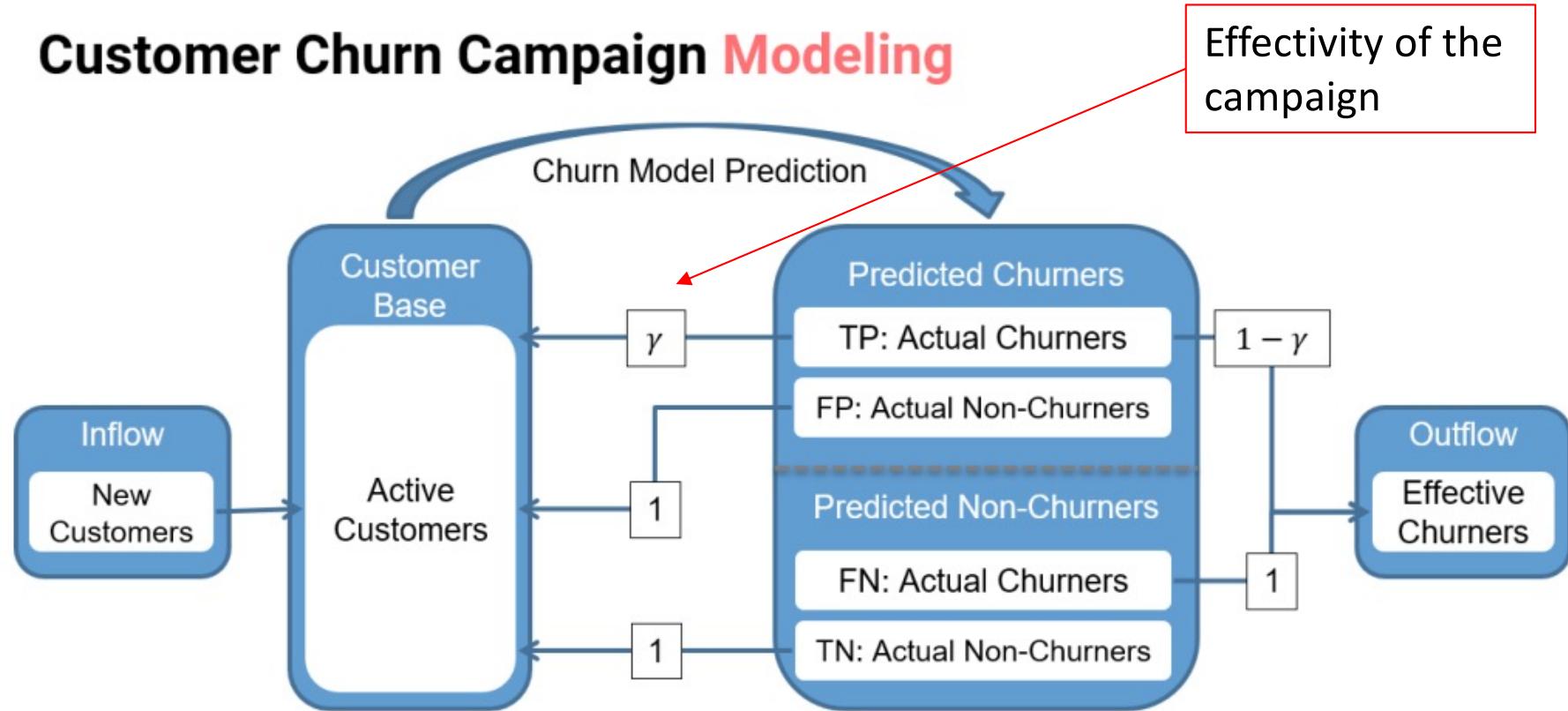


The Churn Problem

- Retaining a customer is less expensive than acquiring a new one (about five times)
- There is a need to have better and more effective churn campaigns
- A typical churn campaign consists in identifying which customers are more likely to leave the company and make an offer to prevent that behavior

Churn Modeling

Customer Churn Campaign Modeling



TP: True positives

FP: False positives

FN: False negatives

TN: True negatives

Measuring model performance

Evaluation of a Campaign

- Confusion Matrix

		True Class (y_i)	
		Churner ($y_i=1$)	Non-Churner ($y_i=0$)
Predicted class (c_i)	Churner ($c_i=1$)	TP	FP
	Non-Churner ($c_i=0$)	FN	TN

- Accuracy = $\frac{TP+TN}{TP+TN+FP+FN}$
- Recall = $\frac{TP}{TP+FN}$
- Precision = $\frac{TP}{TP+FP}$
- F1-Score = $2 \frac{Precision * Recall}{Precision + Recall}$

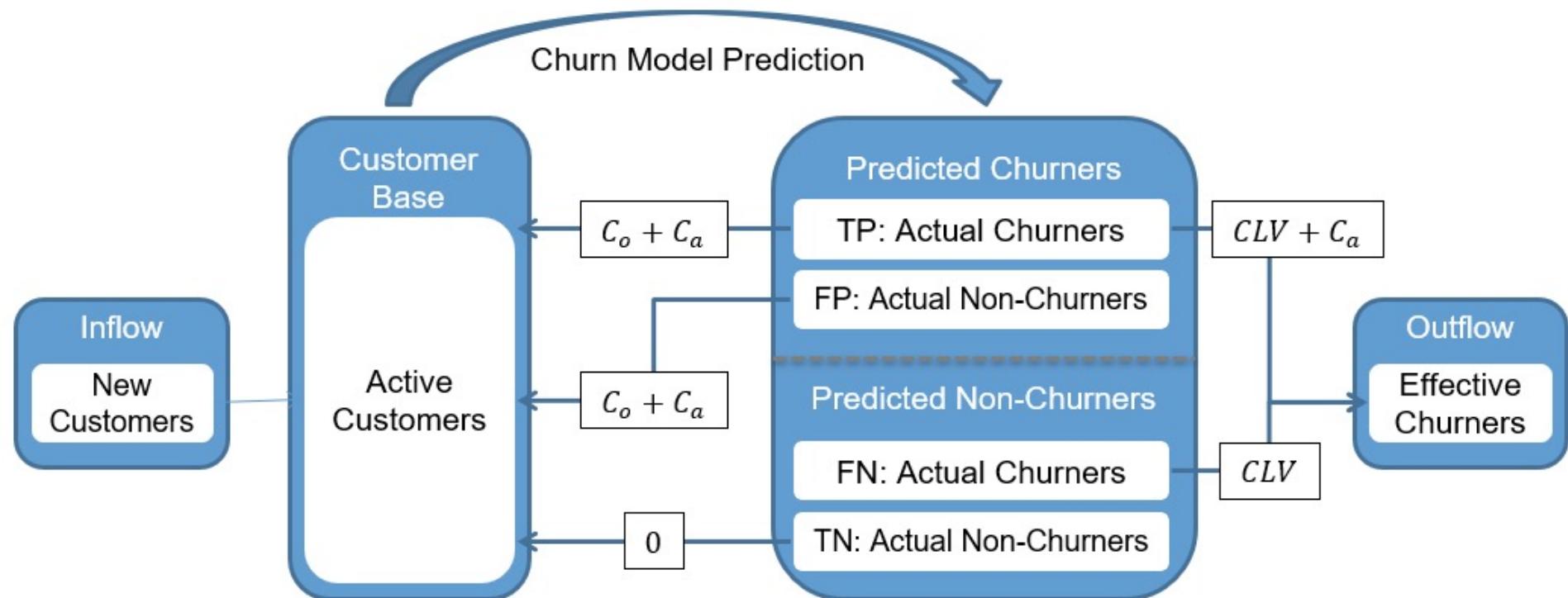


Financial Evaluation of the Campaign

- Note that
 - Misclassification errors may induce different costs
 - The financial losses of misidentifying a churner are different than misclassifying a non-churner
- Thus
 - Need to consider those differences when calibrating and evaluating the model performance

Measuring Financial Performance

Financial Evaluation of a Campaign



C_a = Administrative cost

C_o = Cost of the offer made to the customer

CLV = Customer Lifetime Value

Financial Evaluation of the Campaign

Financial Evaluation of a Campaign

- Cost Matrix

		True Class (y_i)	
		Churner ($y_i=1$)	Non-Churner($y_i=0$)
Predicted class (c_i)	Churner ($c_i=1$)	$C_{TP_i} = \gamma_i C_{o_i} + (1 - \gamma_i) CLV_i + C_a$	$C_{FP_i} = C_{o_i} + C_a$
	Non-Churner ($c_i=0$)	$C_{FN_i} = CLV_i$	$C_{TN_i} = 0$

C_a = Administrative cost

CLV_i = Client Lifetime Value of customer i

C_{o_i} = Cost of the offer made to customer i

γ_i = Probability that customer i accepts the offer

Case study

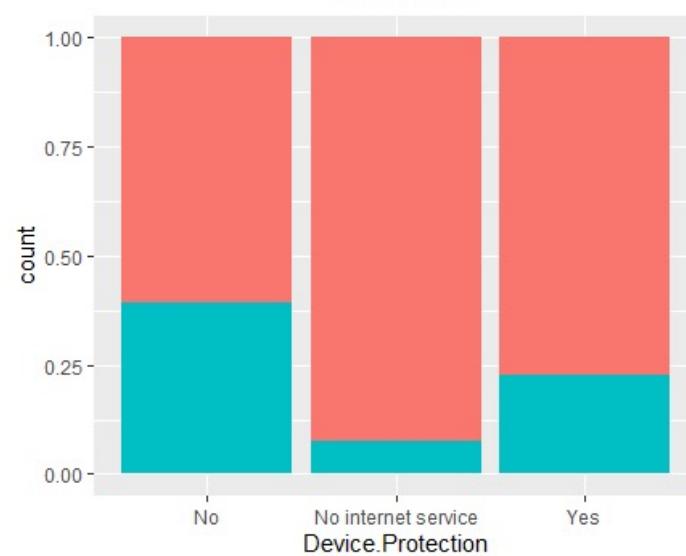
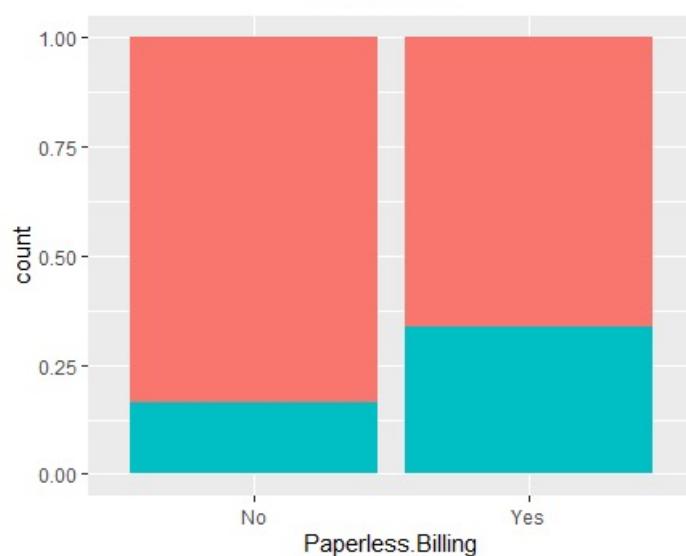
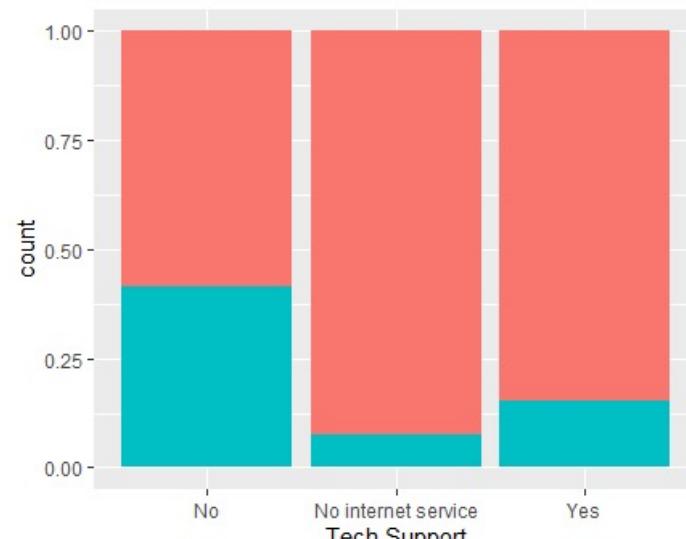
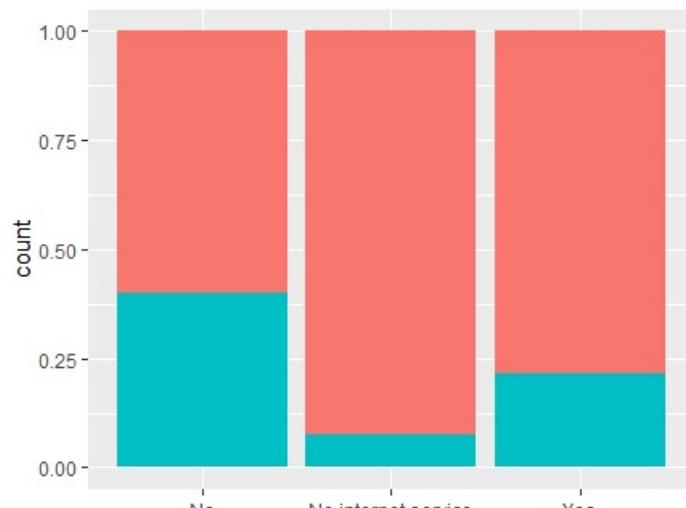
Churn in Telecommunications

- Objective
 - Minimize churn costs of a telecom company
- Action
 - Make an offer to customers which are likely to churn
- Methodology
 - Calculate customers' probability to churn
 - Calculate cost matrix based on predictive model
 - Split (sort) customers using a decision cut-off (churn probability) into churn/no churn
 - Optimize cut-off to minimize costs
- Compare costs using 3 different cut-off strategies
 - Min Error Rate
 - Max F1 score
 - Min Cost

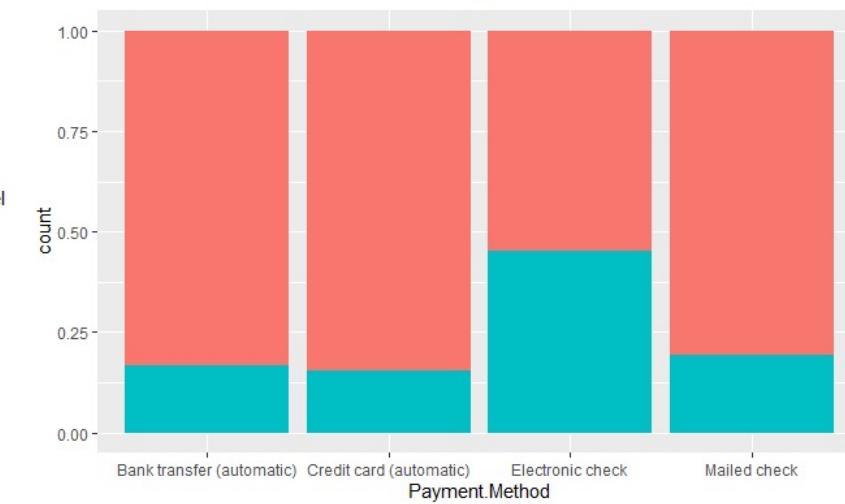
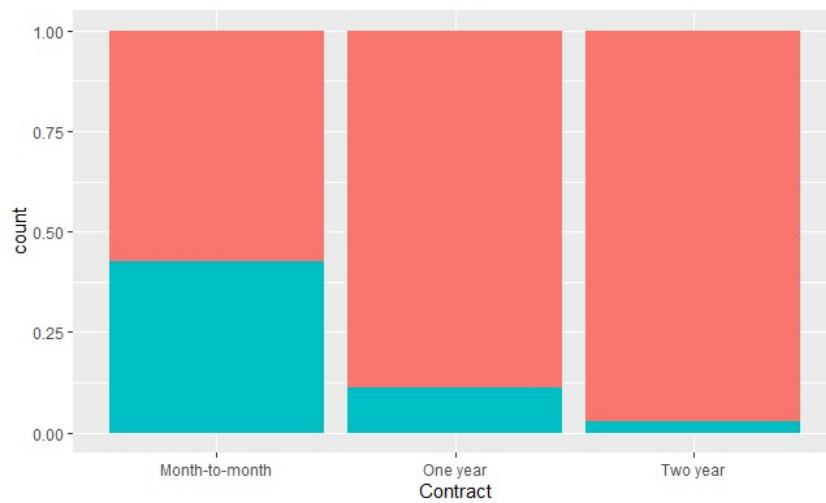
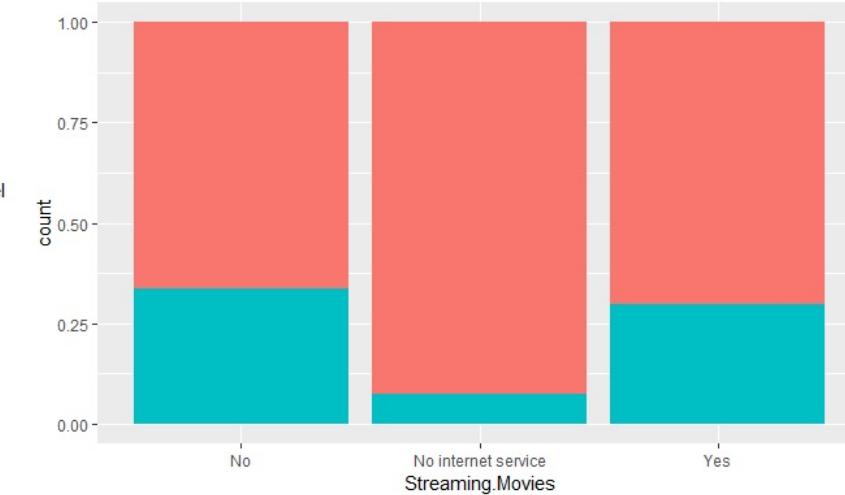
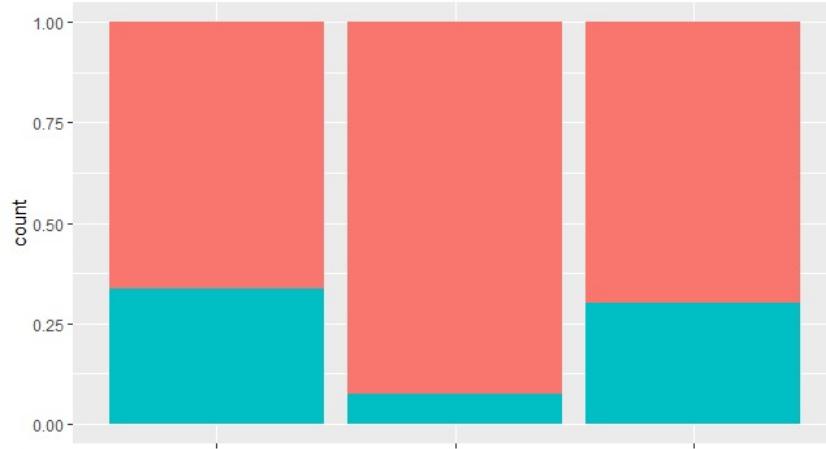
Data

- 7,032 clients
 - Churn rate = 27%
 - Average CLV = \$4,400 (derived from the data)
- Campaign
 - Offer = \$500 (market research assumption)
 - Effectiveness of the offer = 25% (market research assumption)
- 15 variables:
 - Online.Backup , Device.Protection, Tech.Support , Streaming.TV, Streaming.Movies, Contract, Paperless.Billing, Payment.Method, Monthly.Charges, Total.Charges, Churn.Label, Churn.Value, Churn.Score, CLTV, Churn.Reason

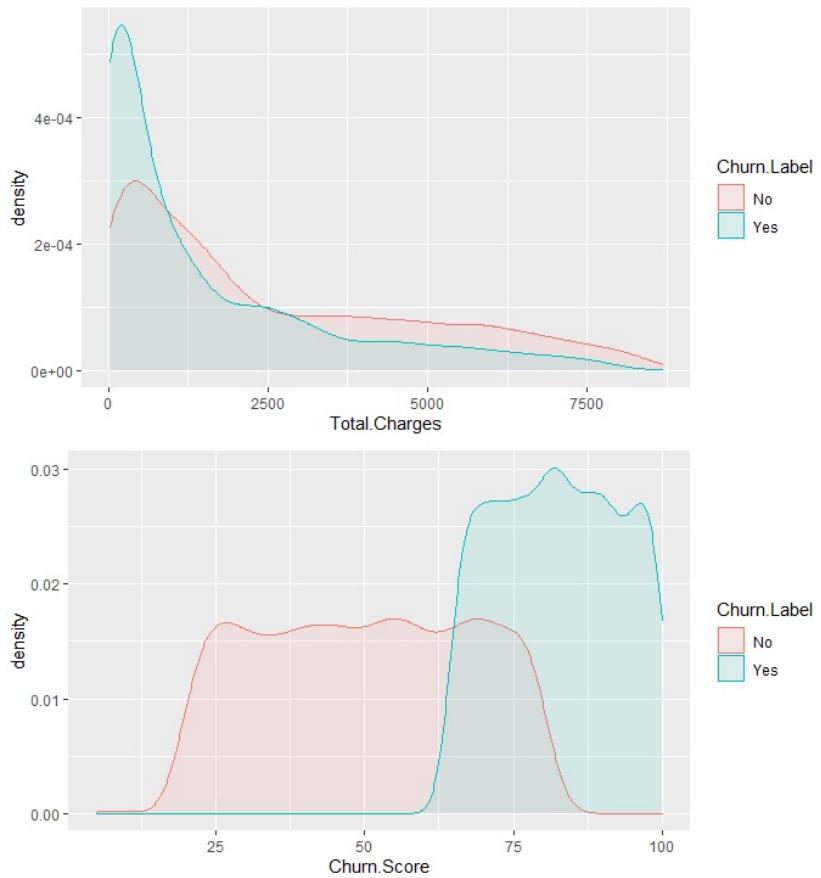
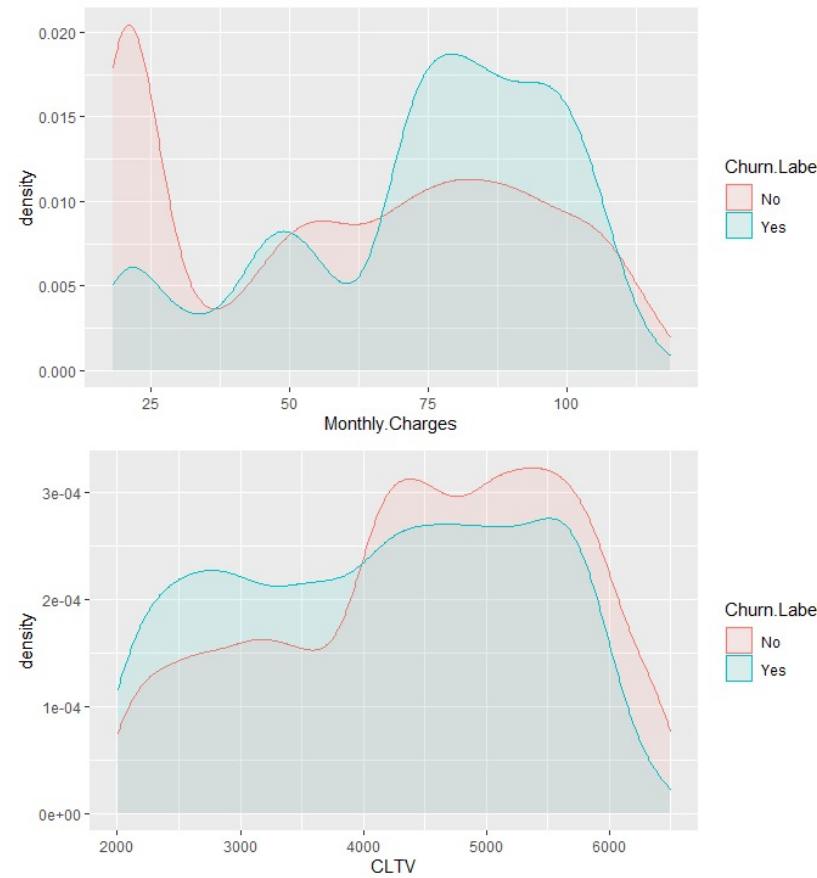
Exploratory Analysis



Exploratory Analysis



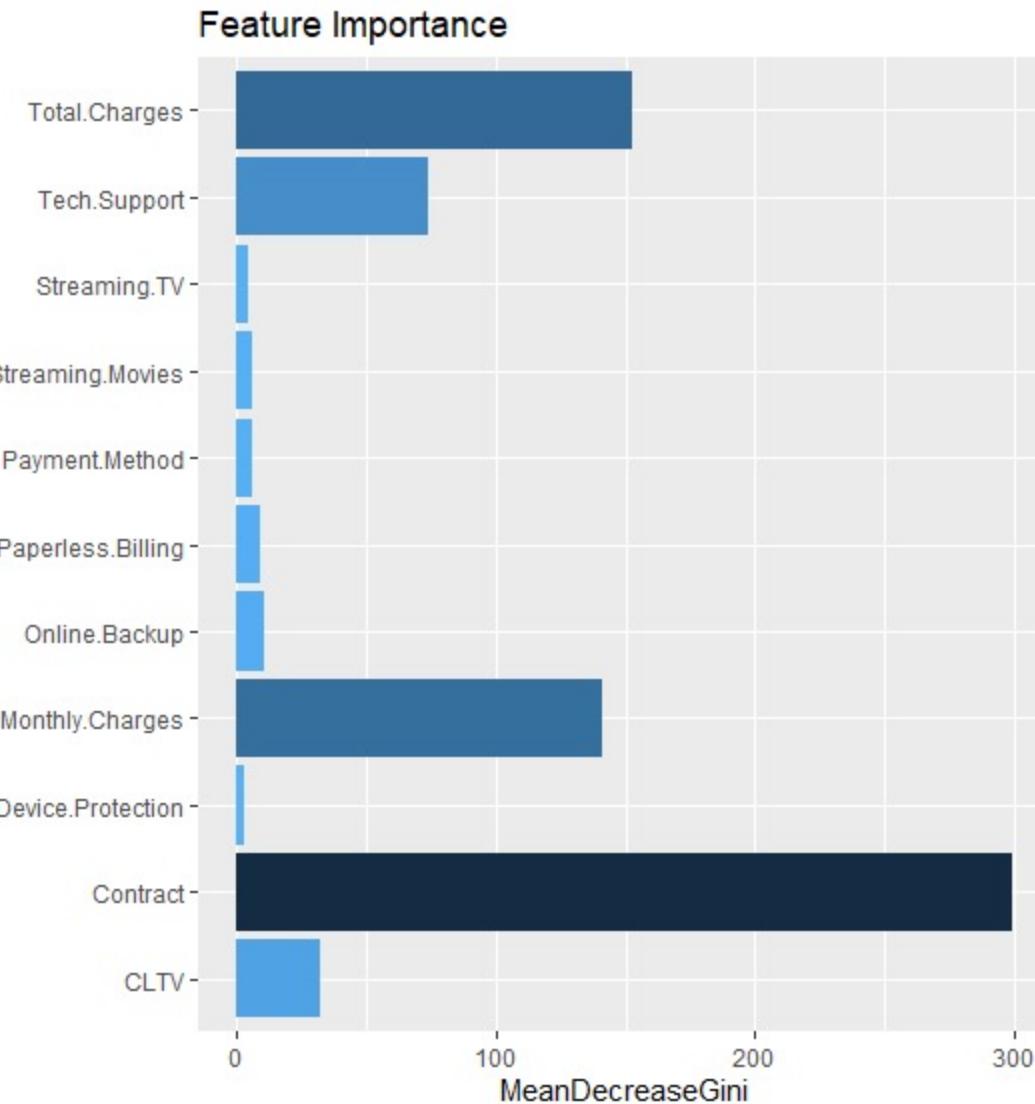
Exploratory Analysis



Churn Modeling

- Data = 7,032 clients
- Churn (y) ~ 11 variables dependent variables (x)
- Removed irrelevant features
 - Churn.Reason, Churn.Score, Churn.Value
- 70/30% Train/Validation set
- Model
 - Random Forest Classifier
- Hyperparameters:
 - Number of trees: 5,000
 - Number of variables randomly sampled as candidates at each split (m.try): 9
 - Maximum number of terminal nodes trees in the forest (max.nodes): 45
 - Minimum size of terminal nodes (node.size): 50
 - Cut-off: Churn rate 27%

Churn Modeling



Churn Prediction Model

- Confusion matrix

Prob.	True Class	
	Churn	No Churn
Predicted Class	Churn	8.5%
	No Churn	71%

- Error rate (%) = 20.5%
- Error rate = $FP + FN = 16.5\% + 4\%$

Churn Costs

Confusion matrix

Prob.	True Class		Cost /client
	Churn	No Churn	
Predicted Class	Churn	8.5%	4%
	No Churn	16.5%	71%

- CLV= \$4,400
- Offer = \$500
- Processing = \$10
- Effectiveness of the offer = 0.25

Individual Cost

Predicted Class	True Class	
	Churn	No Churn
Churn	\$ 3,435	\$ 510
No Churn	\$ 4,400	0

Expected costs

Predicted Class	True Class		
	Cost * Prob	Churn	No Churn
Churn	\$ 1050	\$ 293	\$ 19
No Churn	\$ 738	\$ 0	

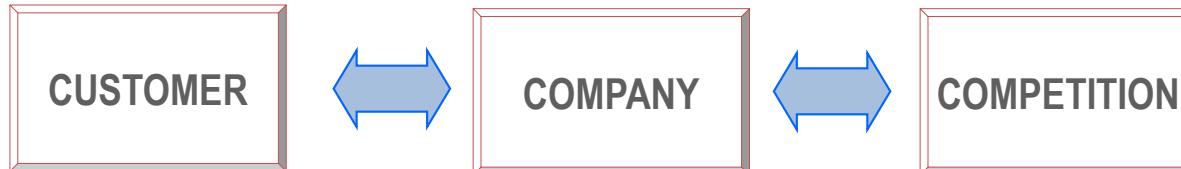
Results & Conclusions

- Different strategies
 - Consider cases where costs of misidentifying a churner and non-churner are quite different
 - In those cases, minimizing error rate or maximizing F1 are not good strategies
- The strategy that considers differential misclassification costs reduces total cost in
 - \$32 /client compared to the initial approach (minimizing error rate)
 - and \$64 /client compared to the strategy of maximizing F1 score
- Implementation issues of retention campaigns
 - Use control group(s)
 - Monitor correct execution
 - Evaluate and improve!

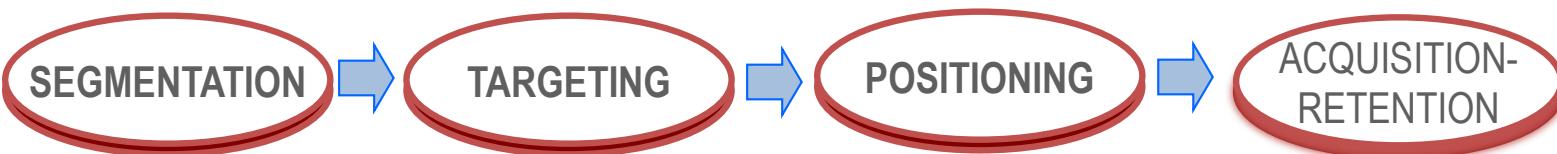
Course Structure

What To Do?

**Identify Market Opportunities
(the 3Cs)**

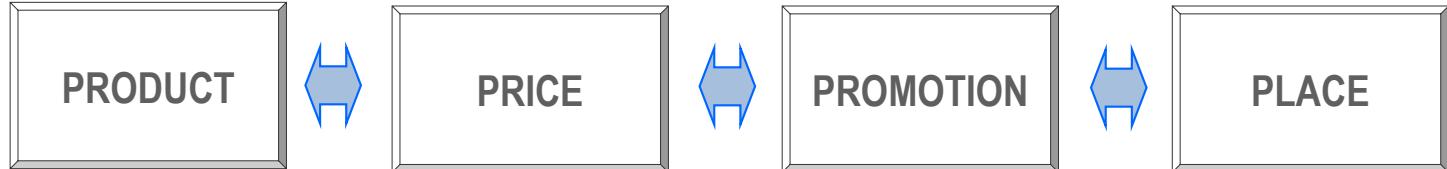


Set Strategy (STP)



How To Do It?

**Formulate Marketing Program
(the 4Ps)**



Objectives

- To understand marketing as a framework for analyzing real-world situations
- To learn managerial tools used in marketing situations
- To be able to critically evaluate basic elements of a marketing program
- To develop skills to define a marketing problem and to formulate a strategy/plan to address it
- To understand that marketing is a **process**

Class Schedule

Date	Topic	Case	Assignment to Submit
August 12	What is Marketing?		
August 13	Consumer Behavior, EVC, CLV Loyalty		
August 19	Segmentation, Targeting & Positioning (STP) and Marketing Intelligence	THE YES	Group HW1
August 20	Product		
August 26	Price and Promotion I	Rocket Fuel	Group HW2
August 27	Promotion II and Place		

Course Logistics and Evaluation

- Required material (cases)
- Evaluation:
 - 2 HWs assignments : 40% (groups)
 - Participation: 20% (individual)
 - Final exam: 40% (individual)

What is Expected from You

- Show up for every class on time and be prepared
- Actively participate in class discussions
- Attendance: you must be present to participate in class!
- Submit assignments on time

Class Participation

- Be familiar with the material
- Be prepared to say *what you think* about what you've read
- Back up your conclusions
- Be prepared to have a lively discussion with your classmates
- Be prepared to be cold called
- ***Quality counts, not quantity!***

Case Analysis and Discussion

- Objective: To learn how to analyze unstructured situations in real-world marketing and apply concepts and tools when relevant
- Balanced quantitative-qualitative analysis
- You are responsible for class discussion and learning
 - Prepare case
 - Focus on logical interpretation, not facts or outcomes
 - Be prepared to support your conclusions and recommendations

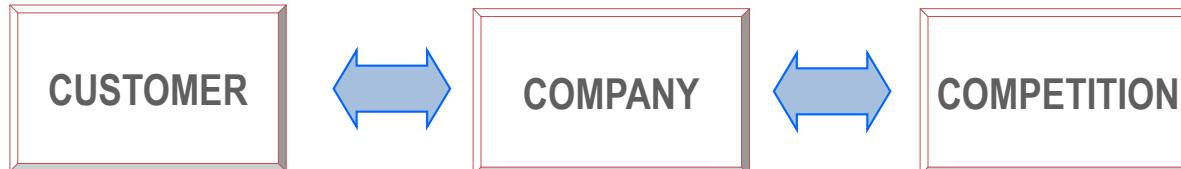
Main Takeaways

- What is Marketing?
 - Delivering value to the customer
- The Marketing Planning Process
 - Analyze Situation: Customer, Company, Competition (the 3Cs)
 - Set Strategy: Segmentation, Targeting, Positioning (STP)
 - Action Plan: Product, Place, Promotion, Price (the 4Ps)

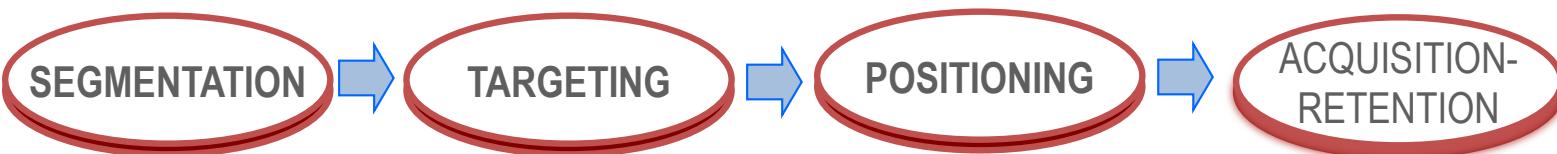
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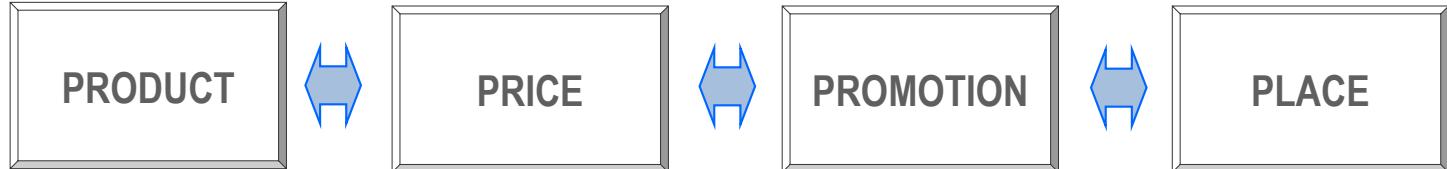


Set Strategy (STP)



How To Do It?

**Formulate Marketing Program
(the 4Ps)**



Next Time...

- Customer Behavior
- Customer Lifetime Value
- Economic Value to the Customer

Introduction to Marketing Analytics

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Professor Ricardo Montoya