

Planet Fitness

Group Member:

Chang Gao, Siyuan Shao, Zhixuan Yang, Guangze Wang, Jacqueline Pezan



Company Profile

- Size:
 - Founded in 1992, currently opens **2,124** gyms in the US and worldwide
 - **13.5 million** members by January 2020, attained a **20%** market share of the US gym membership base
 - Roughly **1,500** corporate-owned employees
- Revenue:
 - Total revenue in 2020 **\$2.8 billion**, of which \$2.4 billion contributed by franchisee-owned stores
 - 30% decline compared to 2019 due to covid-19; expecting to report 31% revenue growth this year, with more people returning to the gym.



Reference:

1. <https://seekingalpha.com/article/4320121-planet-fitness-strong-franchise-growth-and-household-incomes-are-pushing-stock-higher-2020>

Industry Profile: Management Team

BOARD OF DIRECTORS

The following table sets forth the name, age, and position, as of March 8, 2021, of individuals who currently serve as directors on our Board.

Name	Age	Position
Stephen Spinelli, Jr.	66	Chair of the Board
Chris Rondeau	48	Chief Executive Officer and Director
Bernard Acoca	51	Director
Enshalla Anderson	51	Director
Craig Benson	66	Director
Cammie Dunaway	58	Director
Frances Rathke	60	Director
Christopher Tanco	59	Director

Major Historic Event

- **1992:** First Planet Fitness opened in New Hampshire
- **1997:** Planet Fitness unveiled Judgement Free Zone philosophy
- **2003:** First franchise opened in Florida and started franchise business model
- **2011:** Expanded business outside the U.S and landed first oversea store in Puerto Rico
- **2015:** Planet Fitness become a publicly traded company on New York Stock Exchange
- **2016:** Ranked #4 on the Forbes magazine franchises list

Financial Status

Financial Index	Value(million)	YoY(2020 – 2019)
Total Revenue	\$406	-40.97% (Industry Average –58%)
Net Income	-\$15	-111.23%
Total Assets	N/A	+7.72%
Cash From Operations(CFO)	\$31	N/A
Return on Assets(ROA)	N/A	-100.82%
Equity Ratio	N/A	-138.15%
Net Profit Margin	N/A	-3.74%

Planet Fitness' stock is close to its pre-pandemic high, even as membership has suffered from Covid-19.

Following a strong Q2 earnings report, two analysts recently gave the stock a thumbs-up.

Reference:

1. <https://seekingalpha.com/article/4320121-planet-fitness-strong-franchise-growth-and-household-incomes-are-pushing-stock-higher-2020>
2. <https://www.barrons.com/articles/planet-fitness-stock-51622135074>
3. <https://www.fool.com/investing/2021/08/27/why-planet-fitness-stock-jumped-this-week/>

Main Differentiators & Major Product

Major product

- Customer Membership (basic & premium)

Most affordable membership

- Basic membership **\$10** per month, substantially lower than the industry average of **\$30-40** per month¹
- **\$21.99** per month for premium membership

“No Judgement Zone”² Policy

- No weightlifting equipment. No dropping weights, yelling, grunting or other things that make starters uncomfortable
- A beginner-friendly vibe

1. Rizzo, N. (2021, August 6). Average Gym Membership Cost 2021 [Gym Price Analysis]. Athletic Shoe Reviews. <https://runrepeat.com/gym-membership-cost>

2. Why PF? | Quality, Affordable Fitness Centers | Planet Fitness. (n.d.). Why PF? <https://www.planetfitness.com/about-planet-fitness/why-planet-fitness>

Other Differentiating Factors

Distinct membership experience comes with less fees

- Average store has a space of **20,000** square feet guarantees no impose time limits on cardio machines
- Free fitness training offered five days per week for all members
- **Unlimited access**
- Premium membership can bring a friend for free every time you visit
- Monthly free pizza and bagels
- Tanning beds and massage chairs

Franchise store model:

- Franchise strategy, easy to operate model, enables rapid store expansion and absorb more new customers
- Open **2,124** stores across all states in US, the District of Columbia, Puerto Rico, Canada, Panama, Mexico and Australia, annual growth rate **12.8%**

Customer Base

Target Customer:

- Potential market has approximately **250 million** people, representing US population over 14 years of age, 80% of which are not gym members
- Attract occasional gym users and a broad member demographic based on age, household income, gender and ethnicity with low member fees, convenient store location and distinct membership experience
- **13.5** million membership by 2020, reflecting an annual growth rate **10.9%**
- Current member base is over **50%** female and contain both high- and low-income households. Approximately **25%** of stores are located in “low income” areas.

Competitive Base



Best for Machine and Muscle Building

- Found in 1984
- **2.15 Billions** revenue in 2019
- 700+ sites in US and Canada
- Membership fee: **\$34.49/** month
- Extensive selection of free weights and resistance training machines

Best for Frequent Travelers

- Found in 2002
- **1.45 Billions** Revenue in 2019
- 4520+ sites worldwide
- **Membership fee:\$36.5/** month on average
- Always open for business 24/7
- Computerized key fob

Best for Group Class

- Found in 1989
- **200 Millions** Revenue in 2019
- 345 sites in US, Canada, Australia
- Membership fee: **\$9.95 /month**
- Large variety of fun and effective classes (cycling, yoga, action sports, dance, etc)

Company Mission & Values



Mission Statement

“To enhance people’s lives by providing a high-quality fitness experience in a welcoming, non-intimidating environment, which we call the Judgement Free Zone, where anyone – and we mean anyone – can feel they belong.”

Core Values

Excellence

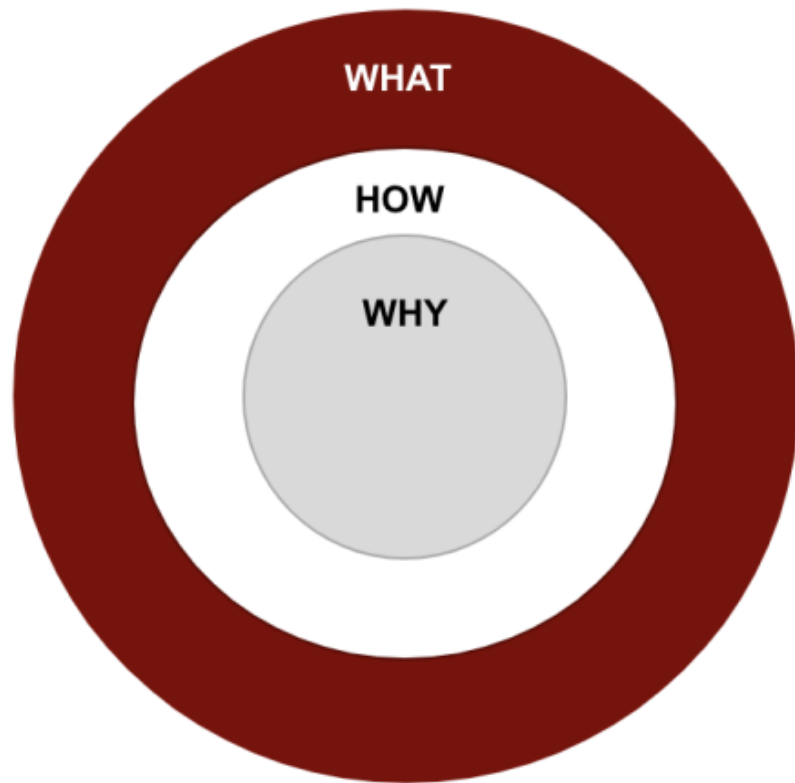
Integrity

Respect

Transparency

Passion

Business Case Mission



WHAT

- Implementing machine learning algorithms into database systems

HOW

- Enhance defaulting algorithm

WHY

- Maximize profit
- Enhanced customer targeting
- Minimize customer attrition
- Optimize customer base to improve membership experience

Business Case Value

Assumptions	
Estimated Cost of Whole Project	\$50,000,000
Average Customer Growth Rate	10.9%
Time Period	1 Year
Average Default Fee	\$180

Facts	
Total Current Members	13,500,000
Default Rate	11.5%
Algorithm Precision	90%

Current State	
Loss Current Customer Default	\$279,450,000
Loss Future Customer Default (1yr)	\$30,460,050
Total Loss	\$309,910,050
Future State	
Savings With Algorithm Current Customer	\$251,505,000
Savings With Algorithm Future Customer	\$27,414,045
Loss from Rejecting Non-Defaulting Customer	-\$27,945,000
Total Savings	\$250,974,545
Impact	\$200,974,045
ROI	40.2%

Technical Solution

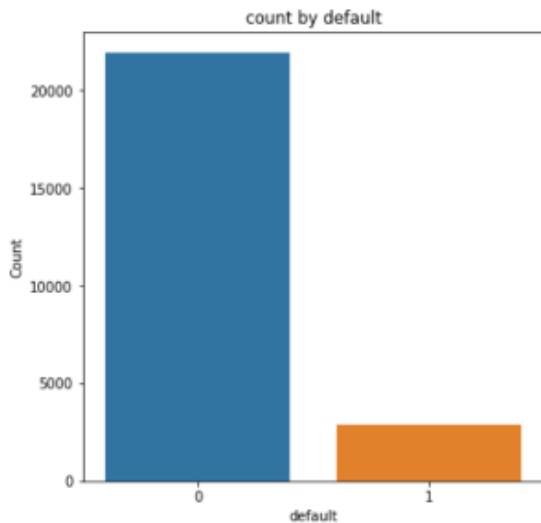
Dataset after data cleaning & transformation

	enrolldt	price	downpmt	monthdue	pmttype	use	age	gender	default
count	24755.000000	24755.000000	24755.000000	24755.000000	24755.000000	24755.000000	24755.000000	24755.000000	24755.000000
mean	1997.800283	1007.226736	200.534872	7.915953	3.094324	1.948091	31.283983	1.497798	0.115451
std	0.746341	435.901892	335.820917	5.110335	1.560044	2.316483	10.289412	0.500005	0.319572
min	1997.000000	50.000000	0.000000	0.000000	1.000000	0.000000	13.000000	1.000000	0.000000
25%	1997.000000	699.000000	50.000000	5.500000	1.000000	0.000000	24.000000	1.000000	0.000000
50%	1998.000000	999.000000	100.000000	6.000000	3.000000	1.000000	28.000000	1.000000	0.000000
75%	1998.000000	1250.210000	175.000000	9.000000	4.000000	3.000000	36.000000	2.000000	0.000000
max	1999.000000	9371.250000	9371.250000	39.930000	5.000000	8.000000	79.000000	2.000000	1.000000

EDA Findings

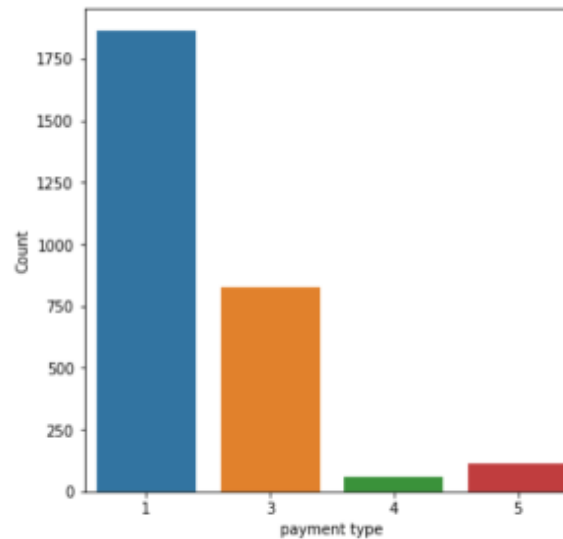
Default rate

- 11.5%



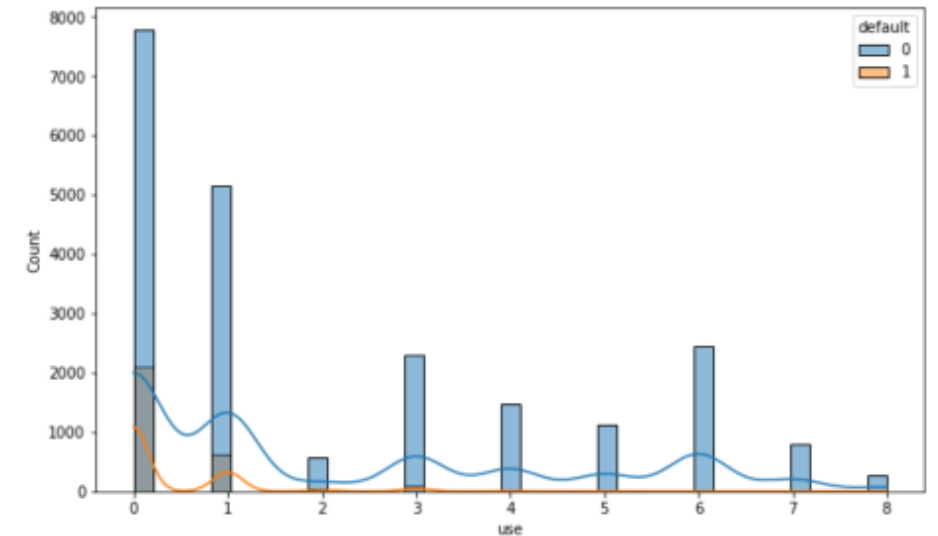
Default by payment type

- Default primarily occur at payment type credit card & cash (24.1% and 16.1% respectively)



Default by usage

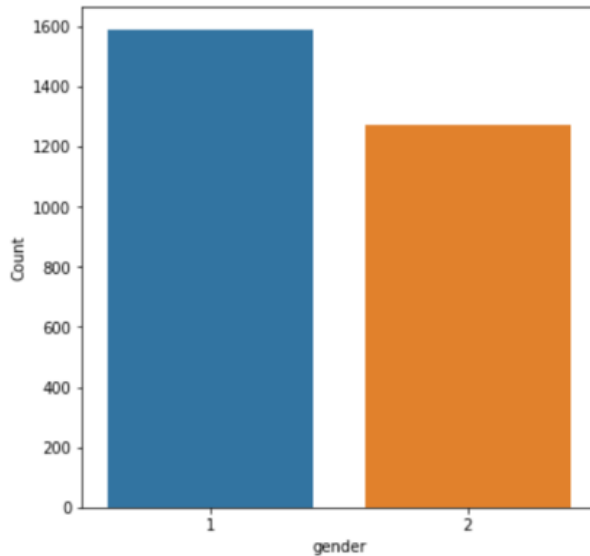
- 21.2% of default occurs with member with 0 usage of gym



EDA Findings

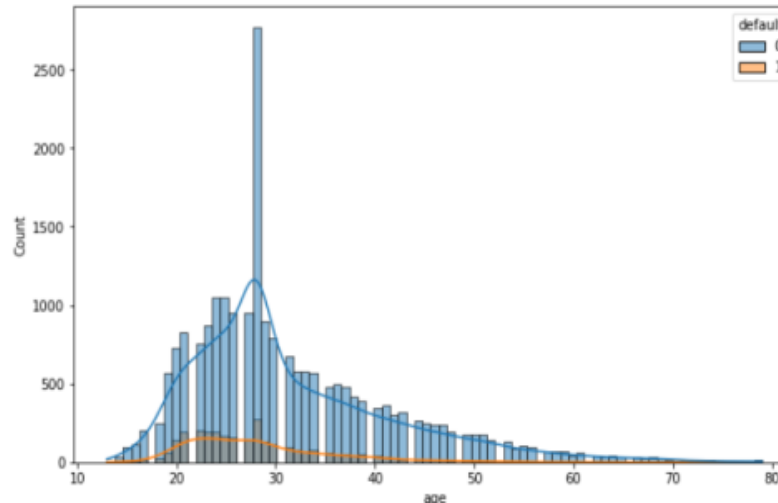
Default by gender

- No significant difference between genders (2.5%)



Age Pattern

- The majority of customers age between 20-30
- Highest count of default occurs between 20-25



Default year

- Default rate in 1999 is significant lower

Year	Default Rate
1997	13.9%
1998	11.9%
1999	6.02%

What algorithms & Why?

Objective: Predict if a customer will default based on label (0:non-default; 1:default)

- **Algorithms Selection:**

- Classification algorithms (Supervised machine learning)
- Logistic Regression, Decision Tree, Random Forest, XGBoost, LightGBM

- **Logistic Regression**

- Easier to implement and interpret
- Great to be used as a benchmark model
- No assumptions about features' distributions
- Model coefficients reveals importance of feature and direction of association (+/-)
- Less inclined to over-fitting

- **Random Forest**

- Wisdom of crowds: More accurate than individual predictions (decision tree)
- Works well with both categorical and numerical data
- Less likely to be influenced by outliers
- Can handle both linear and non-linear relationship

Confusion Matrix for Logistic Regression Model:

```
[[8408  325]
 [ 647  522]]
```

Classification Report for Logistic Regression Model:

	precision	recall	f1-score	support
0	0.93	0.96	0.95	8733
1	0.62	0.45	0.52	1169
accuracy			0.90	9902
macro avg	0.77	0.70	0.73	9902
weighted avg	0.89	0.90	0.89	9902

Confusion Matrix for Random Forest Model:

```
[[8405  328]
 [ 595  574]]
```

Classification Report for Random Forest Model:

	precision	recall	f1-score	support
0	0.93	0.96	0.95	8733
1	0.64	0.49	0.55	1169
accuracy			0.91	9902
macro avg	0.79	0.73	0.75	9902
weighted avg	0.90	0.91	0.90	9902

What algorithms & Why?

Objective: Predict if a customer will default based on label (0:non-default; 1:default)

- **XGBoost**

- A decision-tree-based ensemble Machine Learning algorithm that uses a gradient boosting framework
- Parallel processing, faster than Gradient Boosting.
- Supports Regularization to avoid overfitting

- **LightGBM**

- The framework uses a leaf-wise tree growth algorithm, which is unlike many other tree-based algorithms that use depth-wise growth.
- Faster training speed and higher efficiency
- Lower memory usage

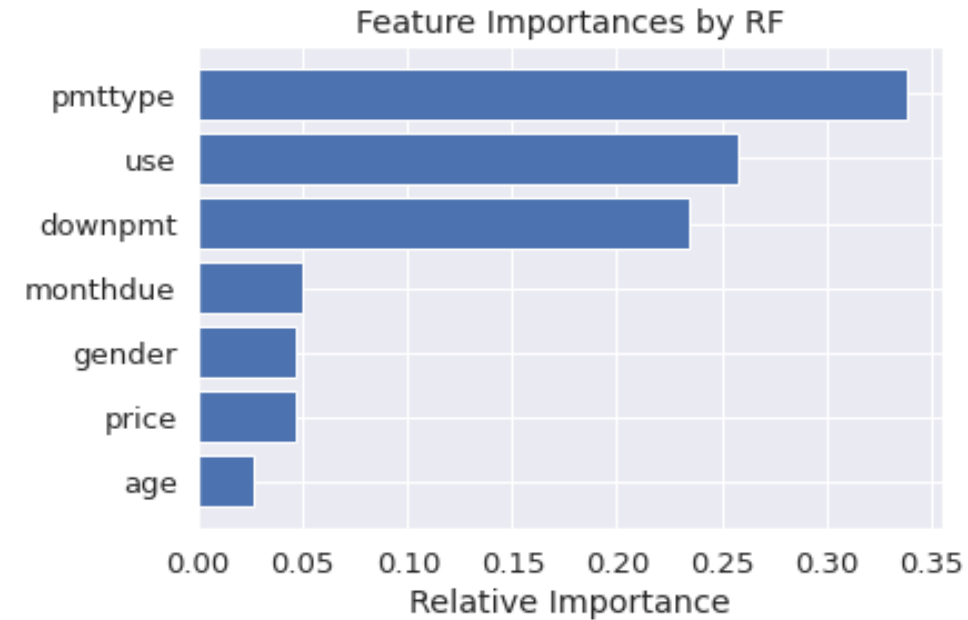
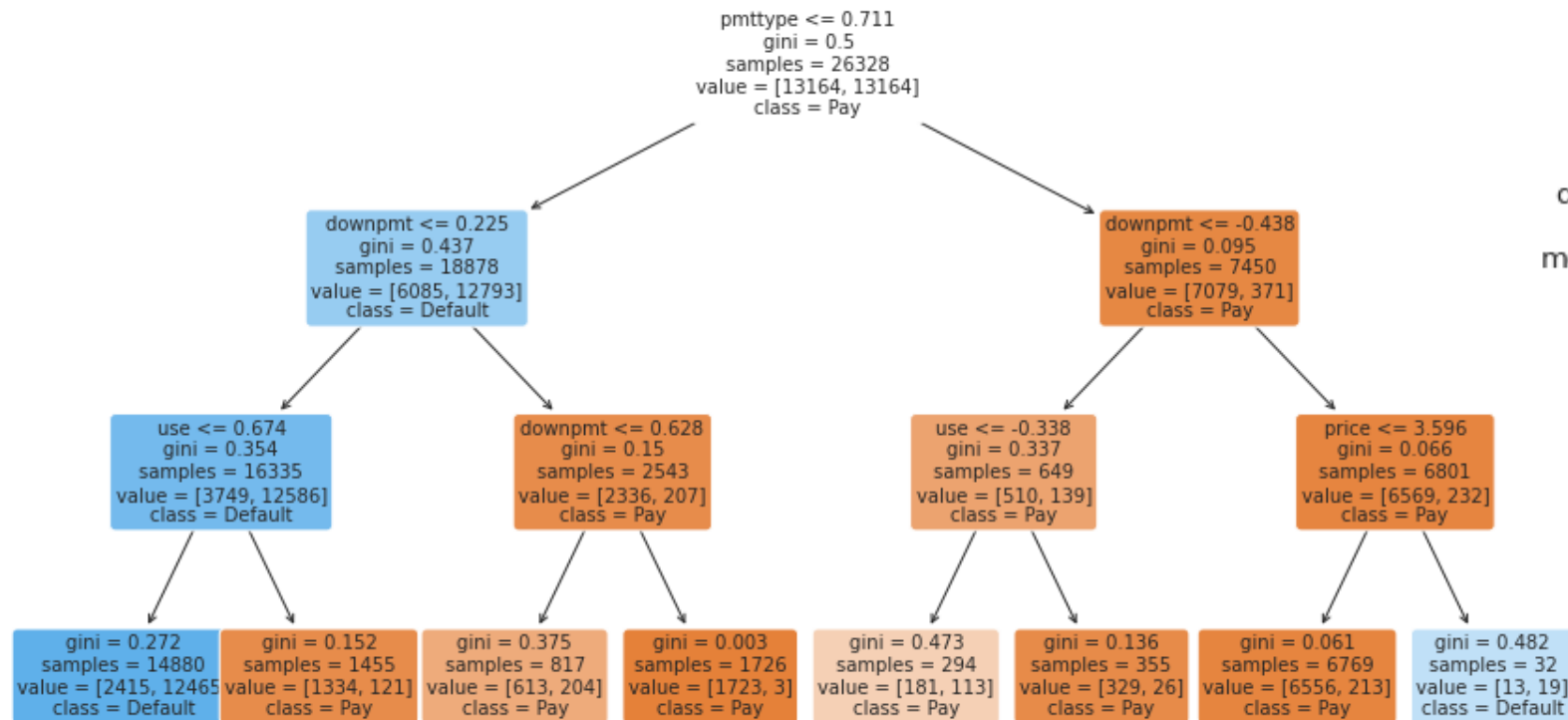
Success Metrics & Business Value

- **Precision** = $TP/(TP+FP)$, and a **high Precision score** is what we are looking for (less FP).
 - High Precision score indicates **less "False Positive"** (identifying a customer as default, while he/she will continue making payments).
 - The **risk** of "False Positive" is that, Planet Fitness will falsely turn down some valuable customers, **losing a large potential market**. (Some loyal customers may bring in their friends to become new members).
 - On the other hand, we can **tolerate up to a certain level of defaulting**, as long as it is controllable (e.g., within 5%). This is because we do not want to discourage customers from coming into our gyms. Instead, we want all the customers **become sticky to our membership**.
- **Recall** = $True\ Positives / (True\ Positives + False\ Negatives)$
 - High Recall score indicates less "False Negatives" (identifying a customer as non-default, while he/she will default).
- Area Under Curve (AUC)
- Run Time Complexity

Modeling

- Balance training data by SMOTE (Synthetic Minority Oversampling Technique)
 - Count of default and non-default customers are same: 13164
- Feature Standardization
 - Standardize features by removing the mean and scaling to unit variance
- Try 5 different models
- Model Tuning
 - Use grid-search to find the optimal hyperparameters

Model Interpretation



From decision tree, customers who used credit cards, did not pay in the early stages, and never use their membership were more likely to default

Model Comparison

Model	Precision	AUC	Recall	Complexity
Logistic Regression	0.90	0.91	0.86	$O(d)$
Decision Tree	0.91	0.86	0.82	$O(\text{depth})$
Random Forest	0.91	0.92	0.87	$O(k \log(n))$
XGBoost	0.91	0.93	0.91	$O(td)$
Lightgbm	0.91	0.93	0.90	$O(k * \# \text{bins})$

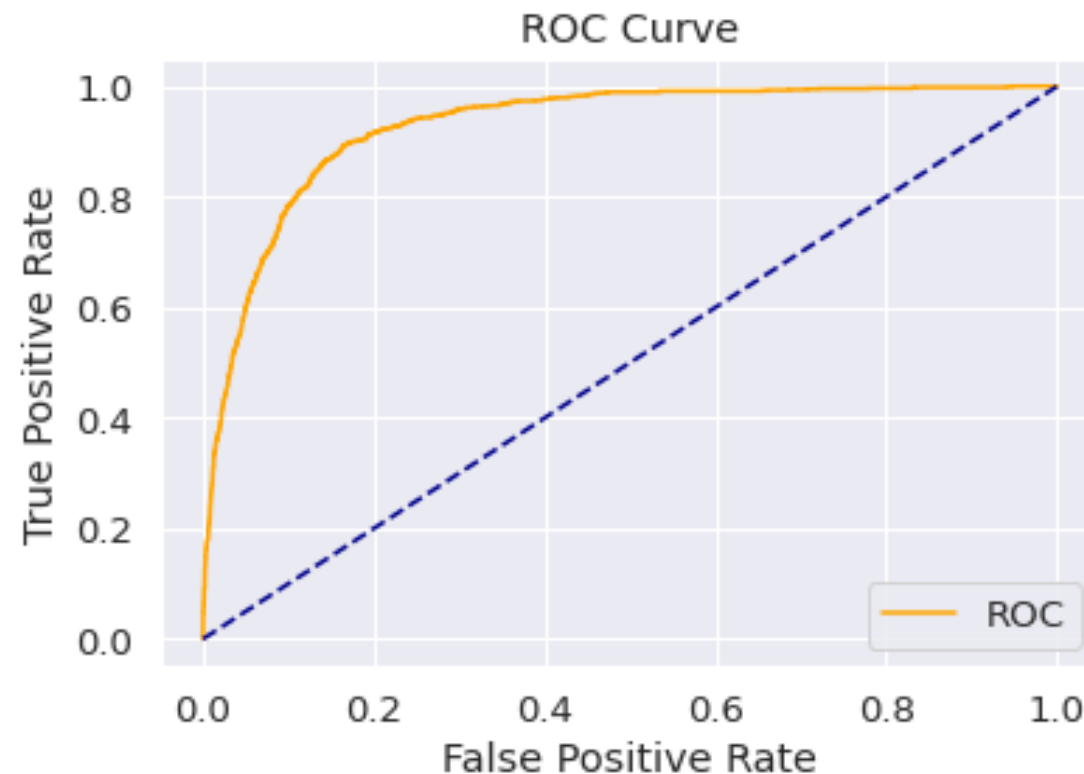
Model Selection --- LightGBM

Confusion Matrix for Lightgbm:

```
[[8061  672]
 [ 348  821]]
```

Classification Report for Lightgbm:

	precision	recall	f1-score	support
0	0.96	0.92	0.94	8733
1	0.55	0.70	0.62	1169
accuracy			0.90	9902
macro avg	0.75	0.81	0.78	9902
weighted avg	0.91	0.90	0.90	9902



Compared with XGBoost, it increased 12% recall for default category & 7 times faster
Compared with Random Forest, it increased 14.7% precision for default category

Further Analysis: Prescriptive & Cognitive

Prescriptive Analysis

- Additional member data needed such as job, income, location, habits to establish customer groups
- Based on the clustering and prediction of default probability, proposed different marketing strategies (action bundles) to understand the potential reason of defaulting and hopefully prevent them from defaulting
- e.g. Advertising plan, Promotion offer, Call, Text

Customer	Default	Advertising	Promotion	Channel	Action Level
001	0	Plan A	N/A	N/A	
002	1	Plan B	10% off	Text	L2
003	1	Plan B	Free 1 month	Call	L1

Further Analysis: Prescriptive & Cognitive

Cognitive Analysis (For project purpose only)

Semantic Deep Learning & NLP:

- Provide customized subscription solutions: Tracking members' social media accounts
- Understand whether there are any upcoming big events which might change members behavior
- e.g. job change, relocation, pregnancy

Facial expression recognition:

- Monitor attendance
- Members' daily emotions
- Deep Neural Networks with Relativity Learning (DNNRL)

Deployment Restriction

- In order to collect customer's social media data, need to carefully deal with data privacy issue
- Consider the cost to deploy cognitive analysis and ROI, we will not consider this step for now

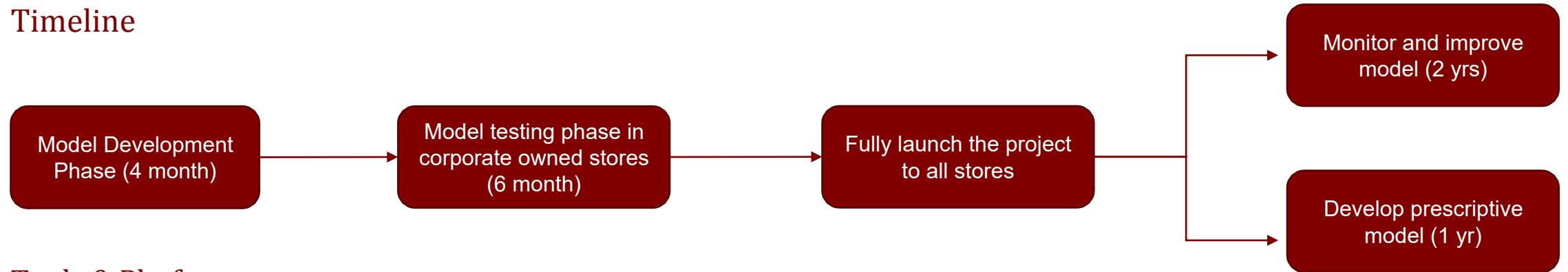


Team Selection

Team Member	Number	Cost	Job Description
Data Scientist	2	\$150,000	<ul style="list-style-type: none">• Data cleaning & Feature engineering• Training models• Monitoring metric to improve model
Data Engineer	1	\$150,000	<ul style="list-style-type: none">• Build pipeline• Deploy algorithms
Project Manager	1	\$70,000	<ul style="list-style-type: none">• Manage project timeline and distribute tasks• Communicate and coordinate between groups• Track and report project progress
Business Expertise (Marketing/ Finance)	0.5/0.5	\$65,000	<ul style="list-style-type: none">• Provide business consultant and insights• Provide budget and evaluate feasibility of project from finance view

Project Execution

Timeline



Tools & Platform

- All customer data and future data will be stored on cloud to shorten project deployment period and save budget
- Models will be trained on virtual machine for better collaboration and efficiency

Partnership

- Collaborate with marketing team to consult business aspect of project and develop prescriptive model
- Collaborate with finance team for budget and project ROI evaluation
- Collaborate with sales team for training and collect feedback
- Collaborate with franchisees to deploy the project to all stores

Thank You



Financial Statement

Planet Fitness, Inc. and subsidiaries Consolidated balance sheets (Amounts in thousands, except per share amounts)

	December 31, 2020	December 31, 2019
Assets		
Current assets:		
Cash and cash equivalents	\$ 439,478	\$ 436,256
Restricted cash	76,322	42,539
Accounts receivable, net of allowance for bad debts of \$7 and \$111 at December 31, 2020 and 2019, respectively	16,447	42,268
Inventory	473	877
Prepaid expenses	11,881	8,025
Other receivables	16,754	9,226
Income tax receivable	5,461	947
Total current assets	566,816	540,138
Property and equipment, net	160,677	145,481
Right-of-use assets, net	164,252	155,633
Intangible assets, net	217,075	233,921
Goodwill	227,821	227,821
Deferred income taxes	511,200	412,293
Other assets, net	1,896	1,903
Total assets	\$ 1,849,737	\$ 1,717,190
Liabilities and stockholders' deficit		
Current liabilities:		
Current maturities of long-term debt	\$ 17,500	\$ 17,500
Accounts payable	19,388	21,267
Accrued expenses	22,042	31,423
Equipment deposits	795	3,008
Deferred revenue, current	26,691	27,596
Payable pursuant to tax benefit arrangements, current	—	26,468
Other current liabilities	25,479	18,016
Total current liabilities	111,895	145,478
Long-term debt, net of current maturities	1,676,426	1,687,505
Borrowings under Variable Funding Notes	75,000	—
Lease liabilities, net of current portion	167,910	152,920
Deferred revenue, net of current portion	32,587	34,458
Deferred tax liabilities	881	1,116
Payable pursuant to tax benefit arrangements, net of current portion	488,200	400,748
Other liabilities	2,511	2,719
Total noncurrent liabilities	2,443,515	2,279,466
Commitments and contingencies (note 17)		
Stockholders' equity (deficit):		
Class A common stock, \$ 0.001 par value - 300,000 shares authorized, 82,821 and 78,525 shares issued and outstanding as of December 31, 2020 and 2019, respectively	8	8
Class B common stock, \$ 0.001 par value - 100,000 shares authorized, 3,722 and 8,562 shares issued and outstanding as of December 31, 2020 and 2019, respectively	1	1
Accumulated other comprehensive income	27	303
Additional paid in capital	45,673	29,820
Accumulated deficit	(751,578)	(736,587)
Total stockholders' deficit attributable to Planet Fitness, Inc.	(705,869)	(706,455)
Non-controlling interests	196	1,299
Total stockholders' deficit	(705,673)	(707,754)
Total liabilities and stockholders' deficit	\$ 1,849,737	\$ 1,717,190

See accompanying notes to consolidated financial statements.

Planet Fitness, Inc. and subsidiaries Consolidated statements of cash flows (Amounts in thousands)

	For the Year Ended December 31,		
	2020	2019	2018
Cash flows from operating activities:			
Net income (loss)	\$ (15,204)	\$ 135,413	\$ 103,162
Adjustments to reconcile net income (loss) to net cash provided by operating activities:			
Depreciation and amortization	53,832	44,346	35,260
Amortization of deferred financing costs	8,411	3,454	3,400
Amortization of favorable leases and asset retirement obligations	57	237	375
Amortization and settlement of interest rate caps	—	—	1,170
Deferred tax expense	7,213	21,625	23,931
(Gain) loss on re-measurement of tax benefit arrangement	(5,949)	5,866	4,765
Provision for bad debts	(74)	87	39
(Gain) loss on disposal of property and equipment	(187)	(159)	462
Loss on extinguishment of debt	—	—	4,570
Other	(484)	(472)	578
Loss on reacquired franchise rights	—	1,810	340
Equity-based compensation	4,777	4,826	5,479
Changes in operating assets and liabilities:			
Accounts receivable	23,611	(895)	(3,825)
Due from related parties	—	—	3,020
Inventory	404	4,244	(2,438)
Other assets and other current assets	(2,676)	(3,100)	5,778
Accounts payable and accrued expenses	(10,930)	(6,268)	(4,586)
Other liabilities and other current liabilities	4,304	1,887	(2,835)
Income taxes	(4,481)	8,251	184
Payments pursuant to tax benefit arrangements	(26,621)	(24,998)	(38,493)
Equipment deposits	(2,212)	(4,900)	1,430
Deferred revenue	(2,842)	11,452	9,640
Deferred rent	2,037	1,821	3,099
Net cash provided by operating activities	31,138	204,311	184,399
Cash flows from investing activities:			
Additions to property and equipment	(52,540)	(57,898)	(48,868)
Acquisitions of franchises	—	(32,613)	(45,752)
Proceeds from sale of property and equipment	282	399	190
Purchase of intellectual property	—	(300)	—
Net cash used in investing activities	(52,258)	(133,094)	(88,416)
Cash flows from financing activities:			
Proceeds from issuance of long-term debt	75,800	550,000	1,200,000
Proceeds from issuance of Class A common stock	2,571	3,863	1,290
Principal payments on capital lease obligations	(165)	(93)	(47)
Repayment of long-term debt	(17,580)	(32,000)	(712,468)
Payment of deferred financing and other debt-related costs	—	(30,577)	(27,333)
Repurchase and retirement of Class A common stock	—	(458,168)	(342,383)
Dividend equivalent paid to members of Pla-Fit Holdings	(234)	(243)	(957)
Distributions to members of Pla-Fit Holdings	(1,822)	(7,434)	(8,300)
Net cash provided by financing activities	37,858	64,348	199,929
Effects of exchange rate changes on cash and cash equivalents	707	—	(844)
Net increase in cash, cash equivalents and restricted cash	17,905	158,856	297,059
Cash, cash equivalents and restricted cash, beginning of period	478,795	320,129	113,080
Cash, cash equivalents and restricted cash, end of period	\$ 515,800	\$ 478,985	\$ 320,139
Supplemental cash flow information:			
Net cash paid (refund received) for income taxes	\$ (2,157)	\$ 10,801	\$ 5,036
Cash paid for interest	\$ 75,629	\$ 53,713	\$ 38,624
Non-cash investing activities:			
Non-cash additions to property and equipment	\$ 1,172	\$ 2,827	\$ 5,451

See accompanying notes to consolidated financial statements.

Planet Fitness, Inc. and subsidiaries Consolidated statements of operations (Amounts in thousands, except per share amounts)

	For the Year Ended December 31,		
	2020	2019	2018
Revenue:			
Franchise	\$ 162,159	\$ 223,139	\$ 175,314
Commission income	696	4,288	6,632
National advertising fund revenue	43,301	50,155	42,194
Corporate-owned stores	117,142	159,697	138,599
Equipment	83,320	251,524	210,159
Total revenue	406,618	688,803	572,898
Operating costs and expenses:			
Cost of revenue	70,955	194,449	162,646
Store operations	87,797	86,108	75,005
Selling, general and administrative	68,585	78,818	72,446
National advertising fund expense	61,255	50,153	42,619
Depreciation and amortization	53,832	44,346	35,260
Other loss	4,434	1,846	878
Total operating costs and expenses	346,858	455,720	388,854
Income from operations	59,760	233,083	184,044
Other income (expense), net:			
Interest income	2,937	7,053	4,681
Interest expense	(82,117)	(60,852)	(50,746)
Other income (expense), net	4,903	(6,107)	(6,175)
Total other expense, net	(74,277)	(59,906)	(52,240)
Income (loss) before income taxes	(14,517)	173,177	131,804
Provision for income taxes	687	37,764	28,642
Net income (loss)	(15,204)	135,413	103,162
Less net income (loss) attributable to non-controlling interests	(213)	17,718	15,141
Net income (loss) attributable to Planet Fitness, Inc.	\$ (14,991)	\$ 117,695	\$ 88,021
Net income (loss) per share of Class A common stock:			
Basic	\$ (0.19)	\$ 1.42	\$ 1.01
Diluted	\$ (0.19)	\$ 1.41	\$ 1.00
Weighted-average shares of Class A common stock outstanding:			
Basic	80,303	82,977	87,235
Diluted	80,303	83,619	87,675

	For the Year Ended December 31,		
	2020	2019	2018
Net income (loss) including non-controlling interests	\$ (15,204)	\$ 135,413	\$ 103,162
Other comprehensive income (loss), net:			
Unrealized gain on interest rate caps, net of tax	—	—	989
Foreign currency translation adjustments	(276)	209	(200)
Total other comprehensive income (loss), net	(276)	209	789
Total comprehensive income (loss) including non-controlling interests	(15,480)	135,622	103,951
Less: total comprehensive income (loss) attributable to non-controlling interests	(213)	17,718	15,189
Total comprehensive income (loss) attributable to Planet Fitness, Inc.	\$ (15,267)	\$ 117,904	\$ 88,762