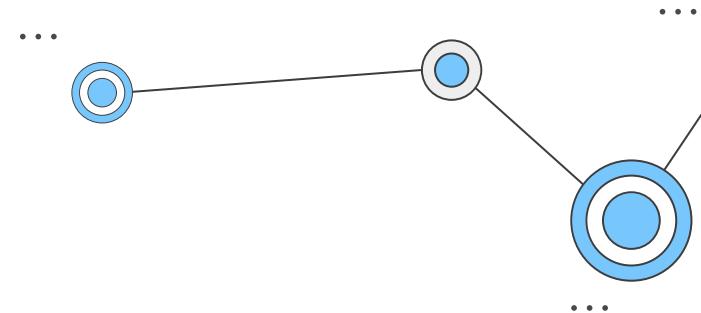


E-COMMERCE CHURN PREDICTION

Numero Uno



OUR TEAM

Amala Fahditia
Fawwaz El Gifari
Ismail Ashari
Stephen James
Azam Fathurahman
Marcelius Steven Susanto
Helmy Naufal Aziz



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Background



Exploratory Data Analysis



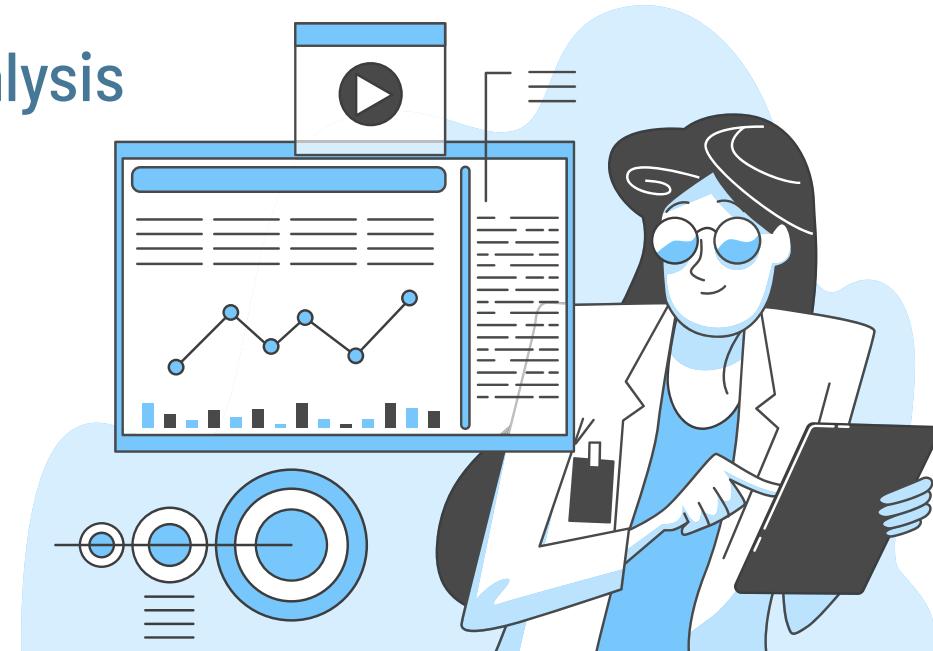
Pre-processing



Modeling



Recommendation





COMPANY PROFILE

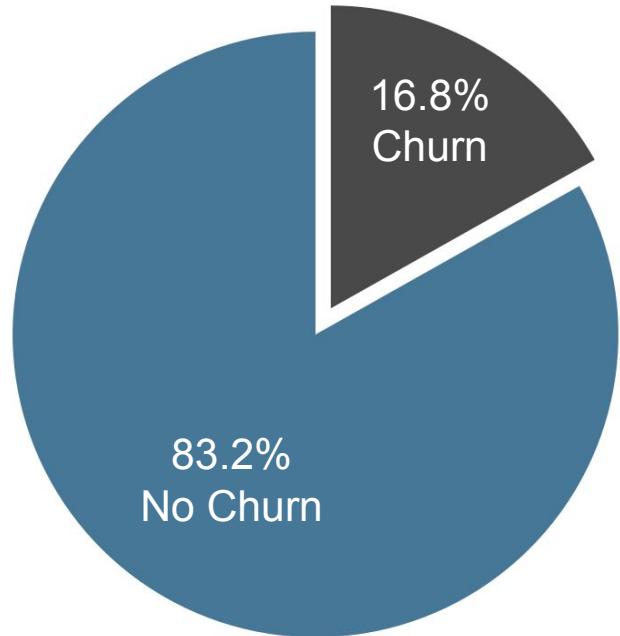
Numero Uno is an e-commerce company that provides various products such as electronics, fashion, grocery and others.

01

BACKGROUND

What is the problem that needs to
solve?

PROBLEM STATEMENT

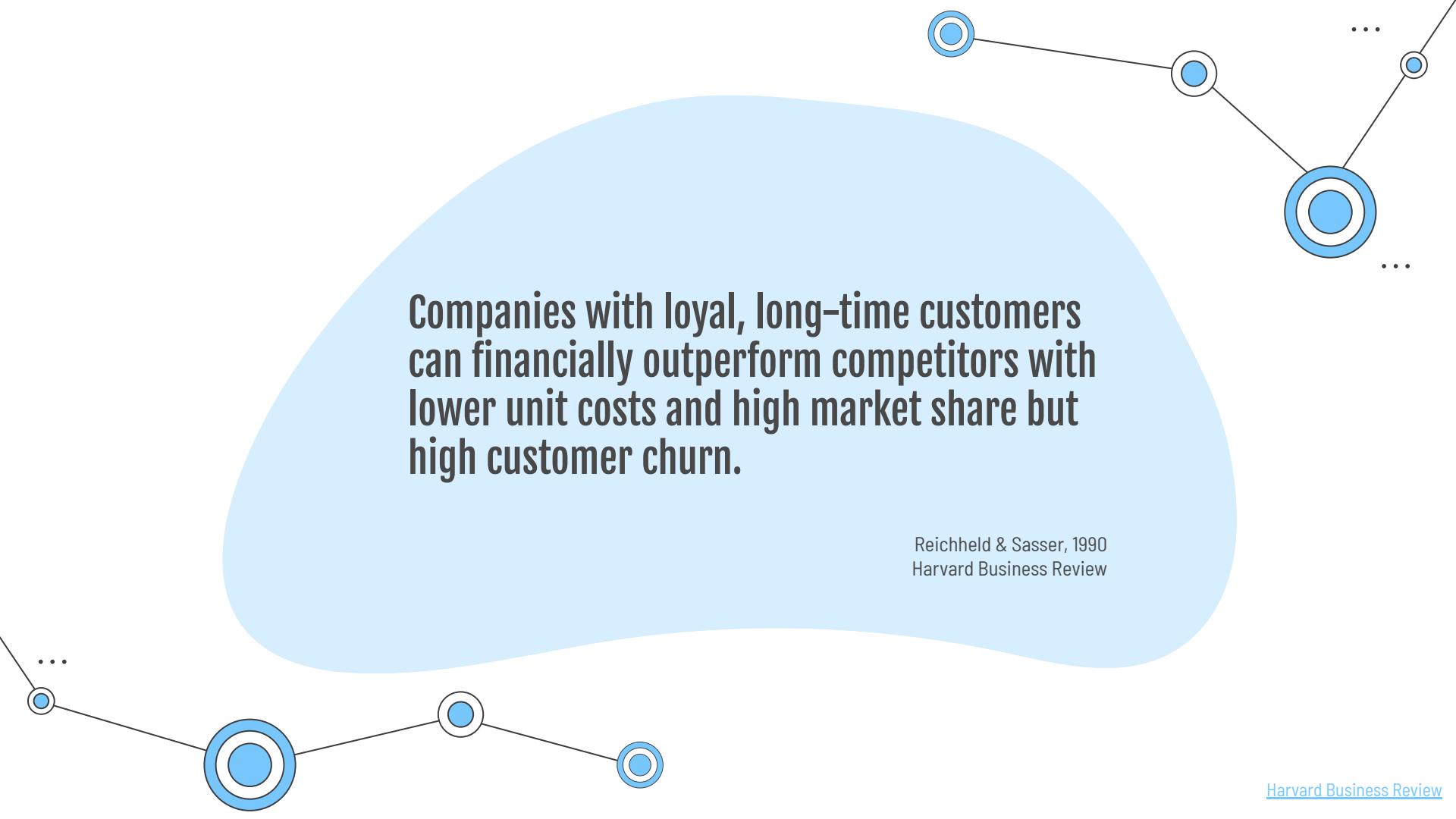


$$\text{Churn Rate} = \frac{\text{Total Churn Customers}}{\text{Total Customers}} \times 100\%$$

Impact of high churn rate:

- Increase Customer Acquisition Cost (CAC)
- Decrease Customer Lifetime Value (CLV)
- Decrease Monthly Recurring Revenue (MRR)
- Decrease Net Revenue Retention (NRR)

Ideal Churn Rate 5 - 10%



Companies with loyal, long-time customers can financially outperform competitors with lower unit costs and high market share but high customer churn.

Reichheld & Sasser, 1990
Harvard Business Review



Goal

- Decrease churn rate to lower potential revenue loss



Objective

- Identify potential causes of churn customer
 - Develop a machine learning model to predict potential customer churn
 - Suggest business recommendations to decrease churn rate
-
- Customer churn rate

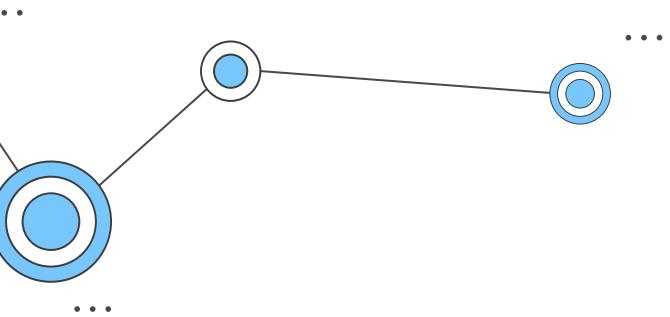


Business Metric

02

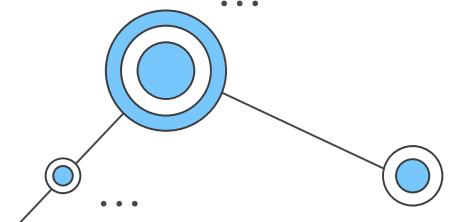
EXPLORATORY DATA ANALYSIS

What insights do we get from the
data?



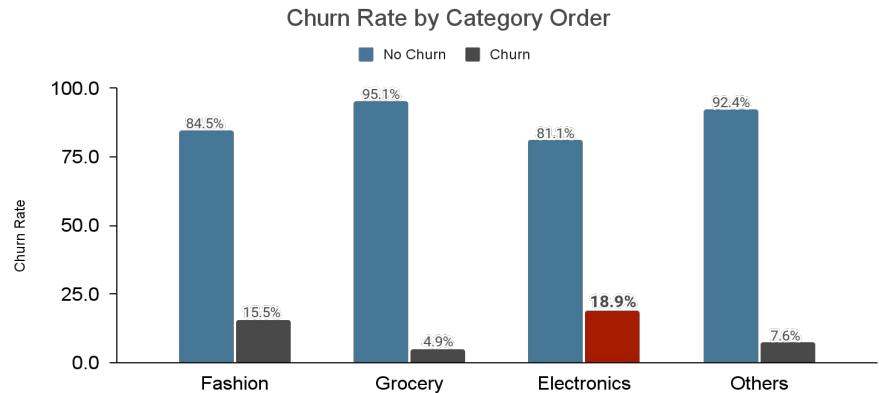
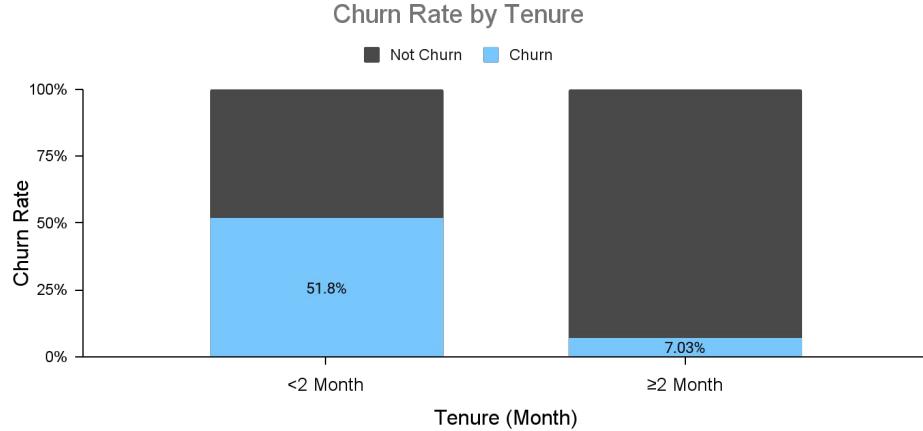
Data Overview

- 20 columns, 5630 rows
- Several columns have missing values
- There is no duplicate data
- **Churn** column will be the target



INSIGHTS

New customers who just join **less than 2 months** have churn rate of **51.8%**



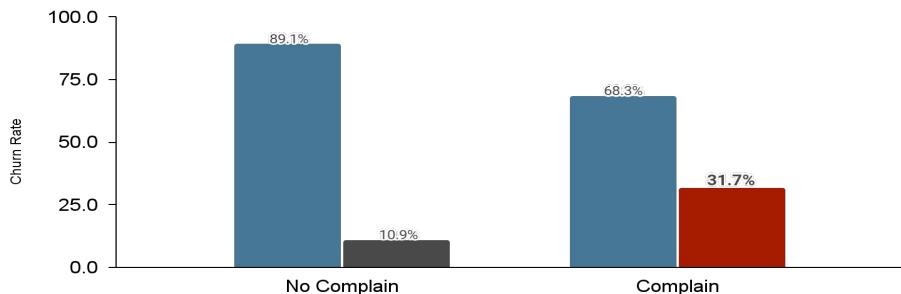
Electronics category has the highest churn rate by **18.9%**

INSIGHTS

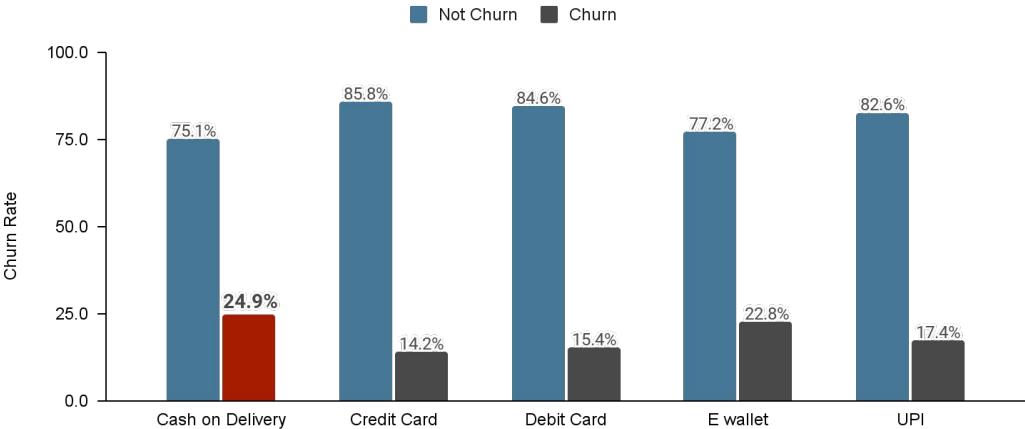
Cash on Delivery has the highest churn rate by **24.9%**



Churn Rate by Complain



Churn Rate by Payment Method



Complain customer has higher churn rate by **31.7%**



03

PRE-PROCESSING

Do the data clean enough to be
processed?

PRE-PROCESSING

- 01 **Cleaning Data**
 - Missing Values: Median
 - Outliers: Z-score
- 02 **Feature Encoding**
 - One Hot Encoding
 - Label Encoding
- 03 **Feature Engineering**
 - Feature Extraction: Average Cashback
 - Feature Transformation: Standard Scalar
 - Feature Selection
- 04 **Split Data**
 - 80% Train Set
 - 20% Test Set
- 05 **Handle Class Imbalance**
 - Oversampling with SMOTE

04

MODELING

What model has the best
performance?



Analysis

Model	acc test	acc train	prec test	prec train	rec test	rec train	f2 test	f2 train
Logistic Regression	0.811	0.809	0.429	0.798	0.848	0.828	0.832	0.796
Decision Tree	0.941	1.000	0.751	1.000	0.898	1.000	0.954	1.000
KNN	0.875	0.949	0.547	0.909	0.917	0.996	0.889	0.918
Random Forest	0.957	1.000	0.819	1.000	0.917	1.000	0.968	1.000
AdaBoost	0.862	0.860	0.521	0.858	0.854	0.863	0.883	0.858
Gradient Boosting	0.895	0.912	0.606	0.914	0.829	0.910	0.918	0.914
Light GBM	0.945	0.987	0.780	0.981	0.879	0.993	0.961	0.983
XGBoost	0.966	0.999	0.858	0.998	0.924	0.999	0.976	0.998



FIND THE BEST MODEL

Logistic Regression		
Metrics	Train	Test
Accuracy	0.809	0.811
Precision	0.798	0.429
Recall	0.828	0.848
F2 Score	0.796	0.832

Decision Tree		
Metrics	Train	Test
Accuracy	1.000	0.941
Precision	1.000	0.751
Recall	1.000	0.898
F2 Score	1.000	0.954

KNN		
Metrics	Train	Test
Accuracy	0.949	0.875
Precision	0.909	0.547
Recall	0.996	0.917
F2 Score	0.918	0.889

Random Forest		
Metrics	Train	Test
Accuracy	1.000	0.957
Precision	1.000	0.819
Recall	1.000	0.917
F2 Score	1.000	0.968

Ada Boost		
Metrics	Train	Test
Accuracy	0.860	0.862
Precision	0.858	0.521
Recall	0.863	0.854
F2 Score	0.858	0.883

Gradient Boosting		
Metrics	Train	Test
Accuracy	0.912	0.895
Precision	0.914	0.606
Recall	0.910	0.829
F2 Score	0.914	0.918

Light GBM		
Metrics	Train	Test
Accuracy	0.987	0.945
Precision	0.981	0.780
Recall	0.993	0.879
F2 Score	0.983	0.961

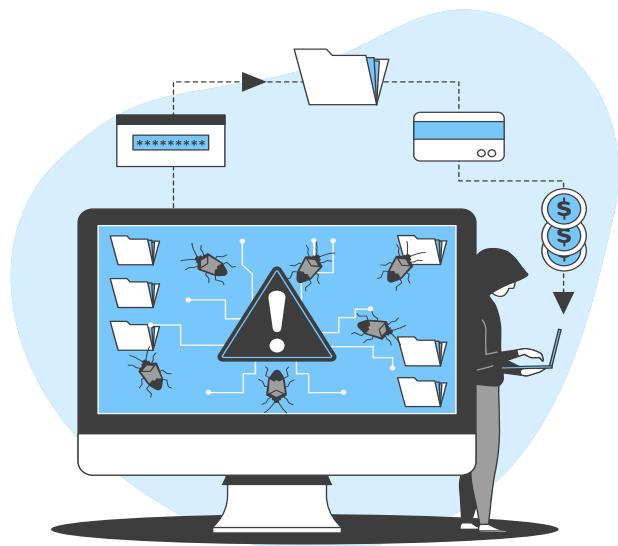
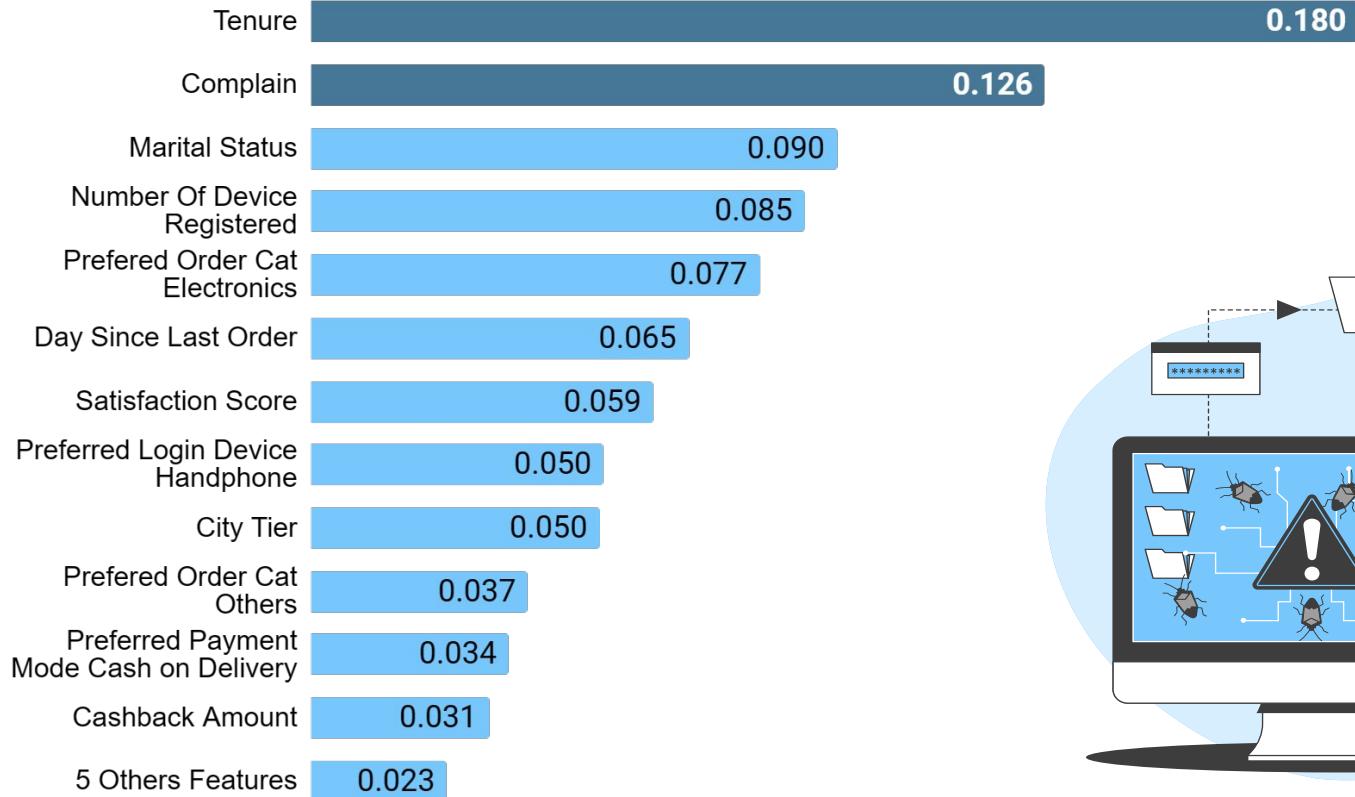
XGBoost		
Metrics	Train	Test
Accuracy	0.999	0.966
Precision	0.998	0.858
Recall	0.999	0.924
F2 Score	0.998	0.976

RESULT



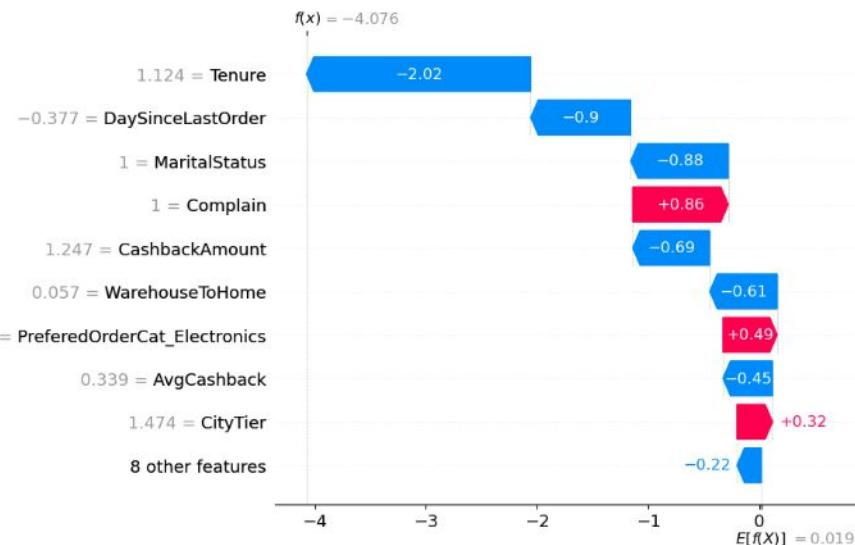
		Actual	
		Not Churn	Churn
Predicted	Not Churn	True Negative 894	False Positive 18
	Churn	False Negative 13	True Positive 145

FEATURE IMPORTANCE

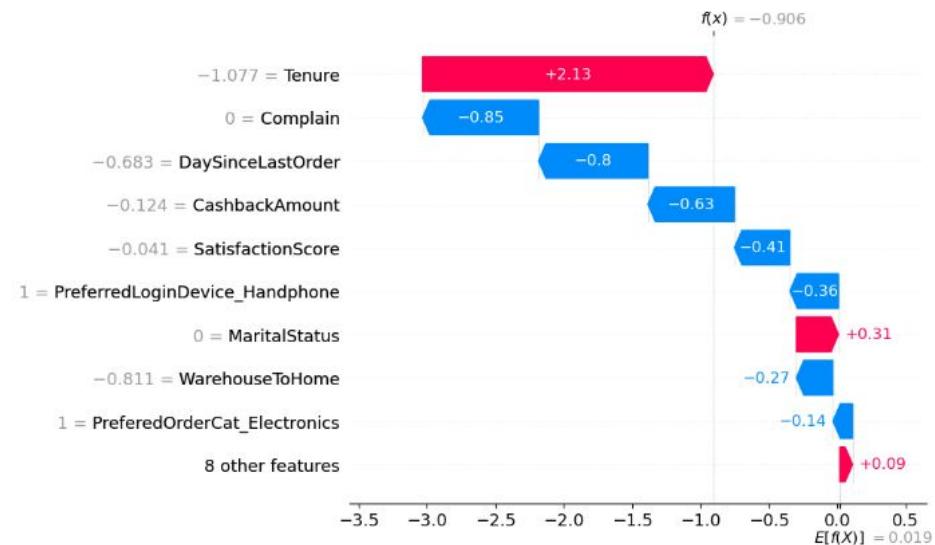


IMPACT OF FEATURES ON CUSTOMER

Not Churn



Churn



IMPACT OF MODEL ON CHURN RATE

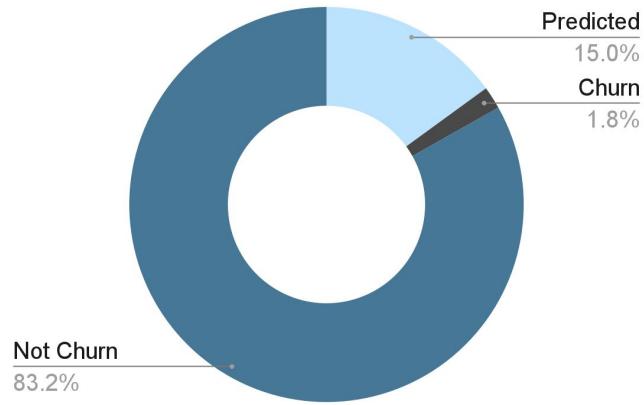
Based on the modeling result, the model has a precision score of 0.889 which means the model can correctly predict potential churn customers by 88.9%.

$$\text{Predicted} = \frac{\text{Precision Score} \times \text{Total Churn}}{\text{Total Customer}}$$

$$\text{Predicted} = \frac{0.889 \times 948}{5630}$$

Predicted = 15%

If the predicted churn customers can be prevented from being churn, we **could reduce the churn rate to 1.8%**.



The model can reduce churn rate by 15%

IMPACT OF MODEL ON REVENUE

Revenue Loss = Churn Customers \times Avg. Spending Customers

Avg. Spending Customers = Rp. 200.000 / month*

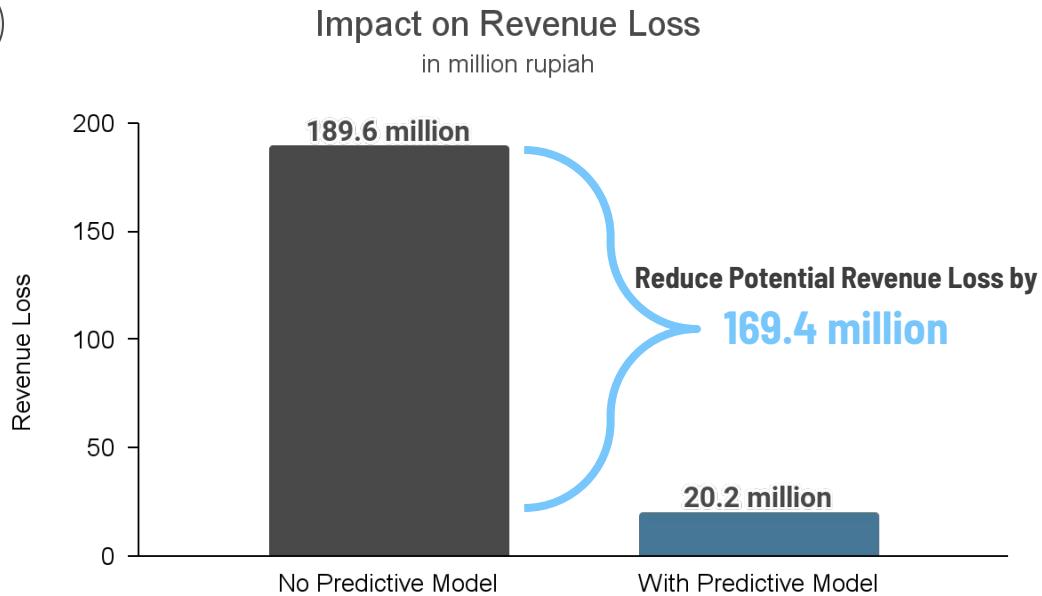
Total Customer = 5630

Without predictive model

- Churn rate = 16.8%
- Churn Customer = 948

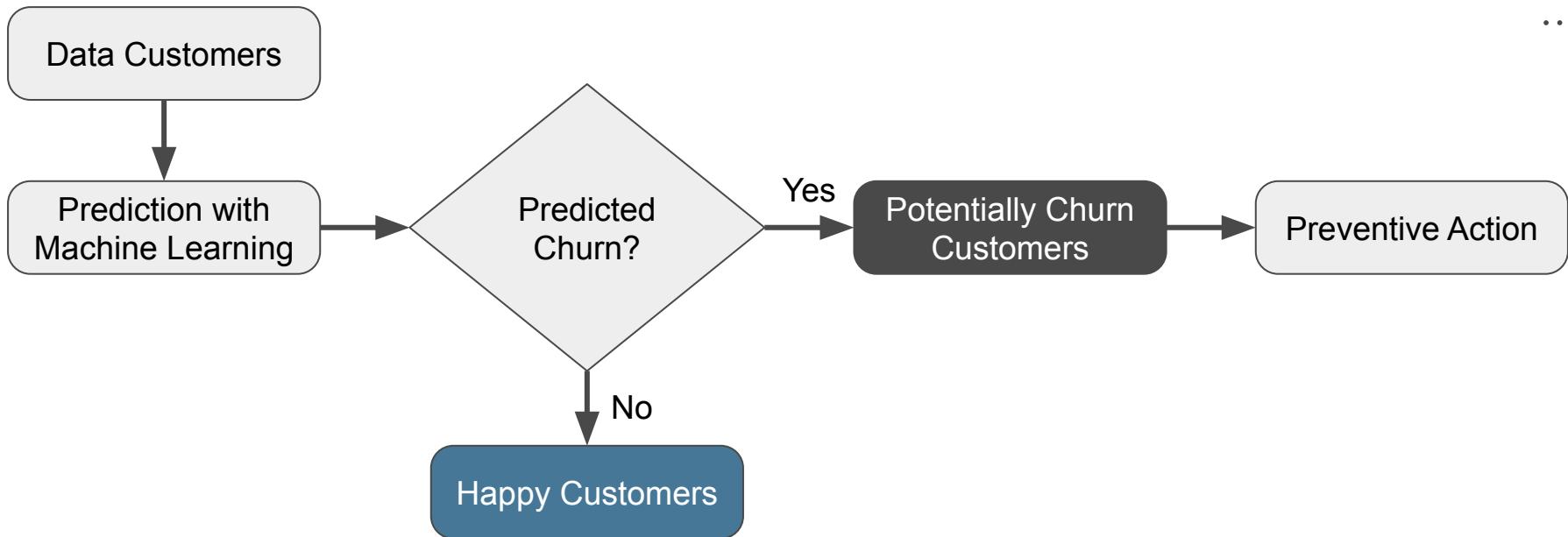
With predictive model

- Churn rate = 1.8%
- Churn Customer = 101



*Average Spending Customer

MODEL IMPLEMENTATION



05 RECOMMENDATION

What action should be taken to solve
the problem?



RECOMMENDATION

01

Give more coupons for new customers

New customers who just joined less than 2 months have a churn rate of 51.8%. Retain customers by giving them more coupons to motivate them to purchase more in order to lower the churn rate.

02

Categorize the complain

Identify the root cause to understand the problem and avoid similar problem in the future in order to reduce complain and churn rate.

03

Improve customer service

91% of customers are more likely to make another purchase after a positive customer service experience.

RECOMMENDATION

01

Give more coupons for new customers

New customers who just joined less than 2 months have a churn rate of 51.8%. Retain them by giving them more coupons to motivate them to purchase more in order to lower the churn rate.

Avg. Spending Customers = Rp. 200.000 / month*

Cashback = 10%*

Understanding the Problem



Neptune

Neptune is the farthest planet from the Sun

...



Mercury

Mercury is the smallest planet in the Solar System

...



Jupiter

Jupiter is the biggest planet in the Solar System

...



Our Solutions

01

Mercury

Mercury is the closest planet to the sun

02

Venus

Venus is the second planet from the sun

03

Jupiter

Jupiter is the biggest planet of them all

04

Neptune

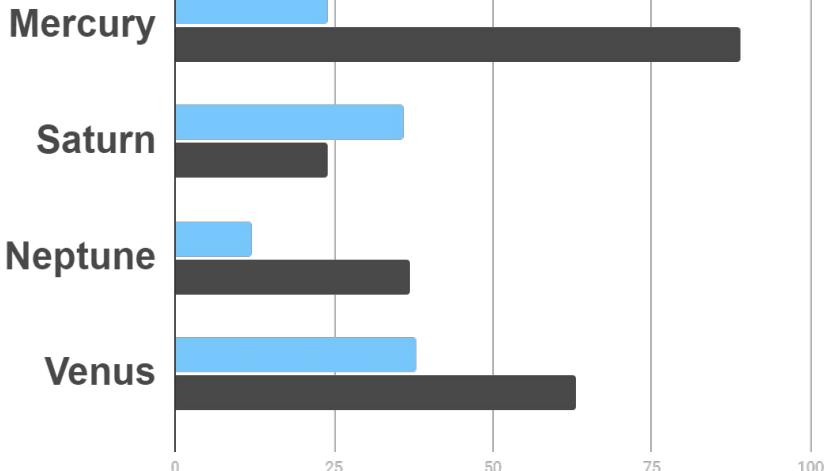
Neptune is the farthest planet from the Sun

Main Competitors

	Mercury	Jupiter	Venus	Neptune
🚀	✖	✖	✖	✖
💰	✖	✓	✖	✓
🏆	✓	✖	✓	✖
coins	✓	✓	✖	✖

Market Research

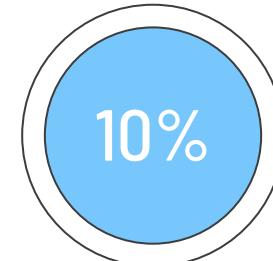
Evolution



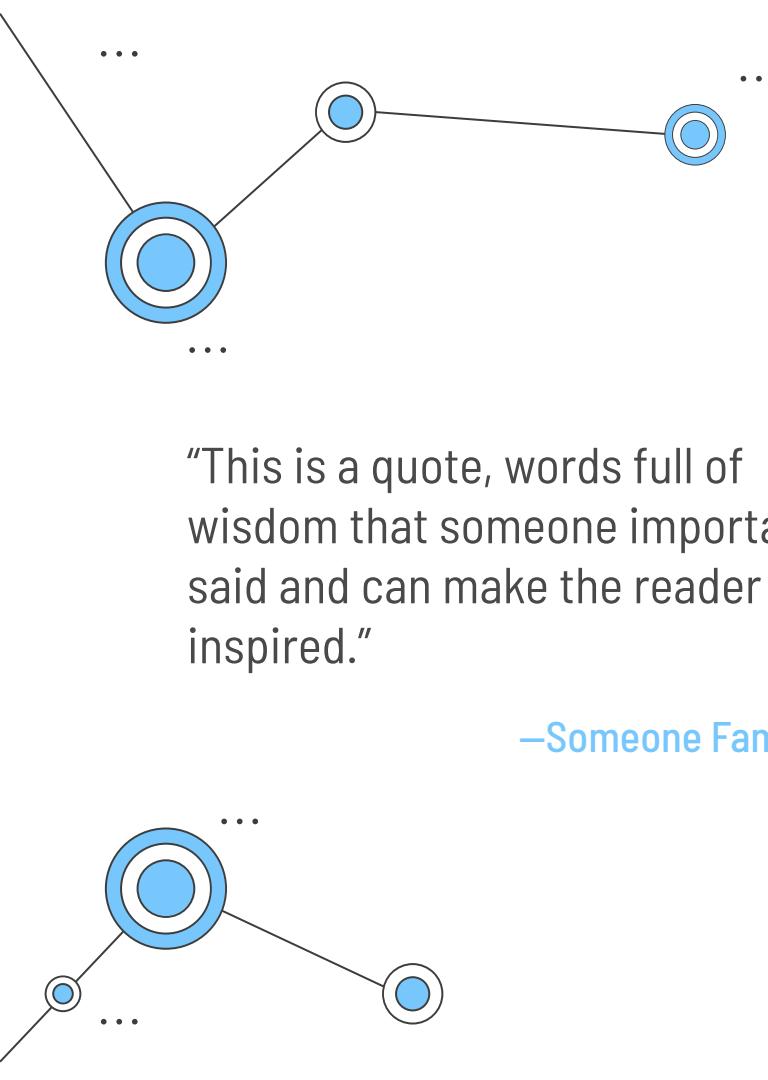
To modify this graph, click on it, follow the link, change the data and paste the resulting graph here



Gross Revenue in the Sector



Sector Growth



“This is a quote, words full of wisdom that someone important said and can make the reader get inspired.”

—Someone Famous



Awesome Words

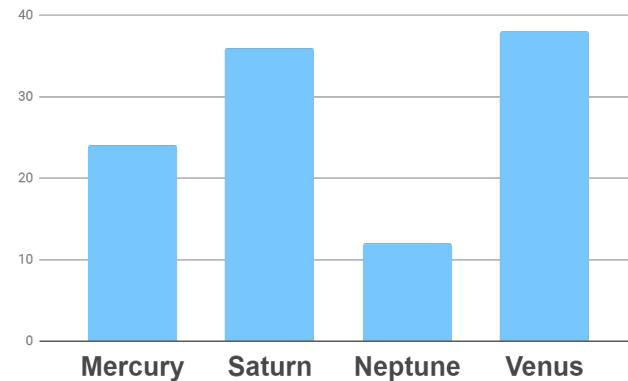


Analysis

Outreach



Top Rated Values



To modify this graph, click on it, follow the link, change the data and paste the new graph here



333,000.00

earths is the sun's mass

24h 37m 23s

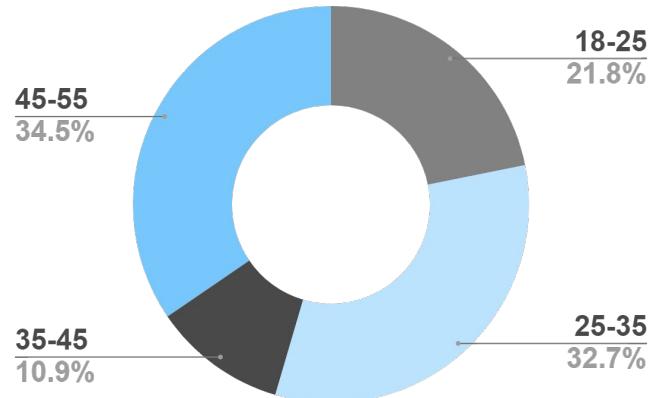
is Jupiter's rotation period

386,000 km

is the distance to the Moon

Target

Age

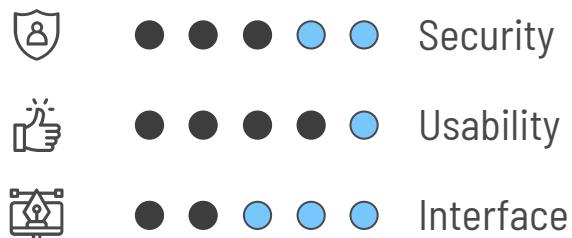


To modify this graph, click on it, follow the link,
change the data and paste the new graph here

Gender



Interests



Our Process

Mercury is the closest planet to the Sun

Venus is the second planet from the Sun

Day 1

Day 2

Day 3

Day 4

Jupiter is the biggest planet in the Solar System

Neptune is the farthest planet from the Sun

Whoa!

This could be the part of the presentation where you can introduce yourself, write your email...

Our Consultants

...
Jane Patterson

Mercury is the
closest planet to
the Sun

...
John James

Venus is the
second planet
from the Sun

...
Joe Doe

Neptune is the
farthest planet
from the Sun



Our Partners



Mercury

Mercury is the closest planet to the Sun



Jupiter

Jupiter is the biggest planet of them all



Neptune

Neptune is the farthest planet from the Sun



Saturn

Saturn is the ringed one and a gas giant



Mars

Despite being red, Mars is actually a cold place



Venus

Venus is the second planet from the Sun

Testimonials

Helena James

"Mercury is the closest planet to the Sun"

Jenna Doe

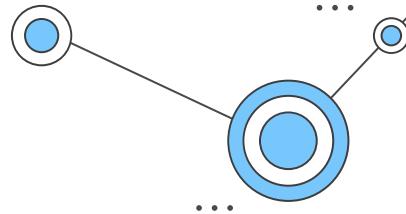
"Jupiter is the biggest planet of them all"

Mary Patterson

"Neptune is the farthest planet from the Sun"



Awards



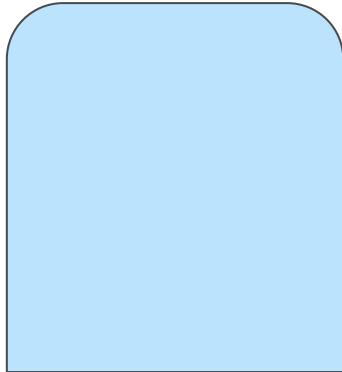
Mercury

It's the closest planet
to the Sun



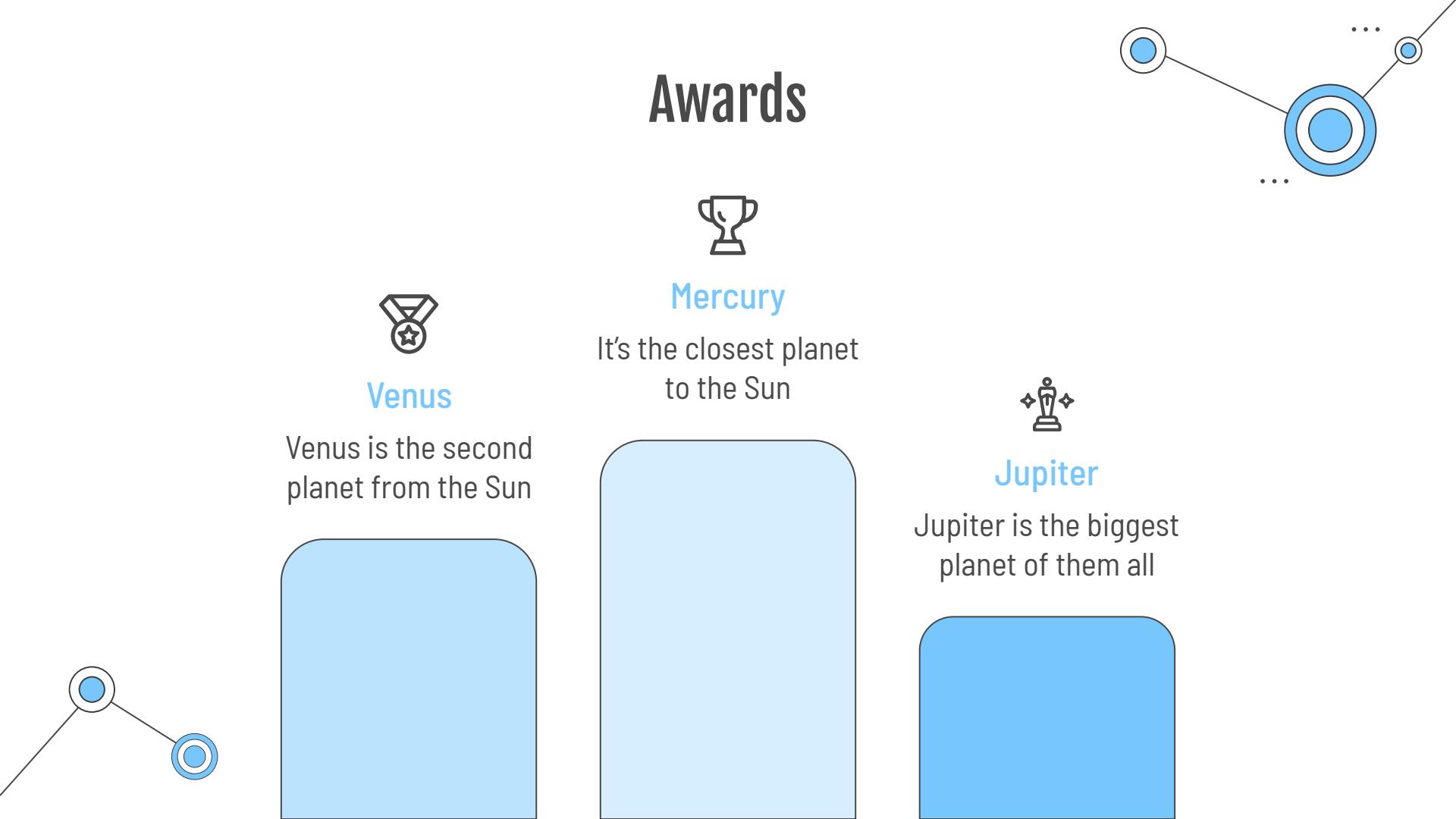
Venus

Venus is the second
planet from the Sun



Jupiter

Jupiter is the biggest
planet of them all

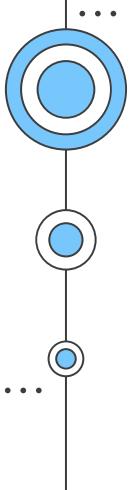




498,300,000

Big numbers catch your
audience's attention

Upcoming Goals



January

February

March

April

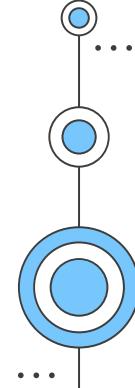
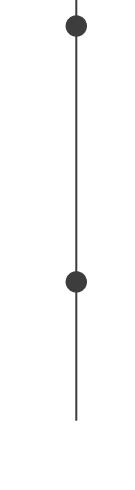
Goal 1



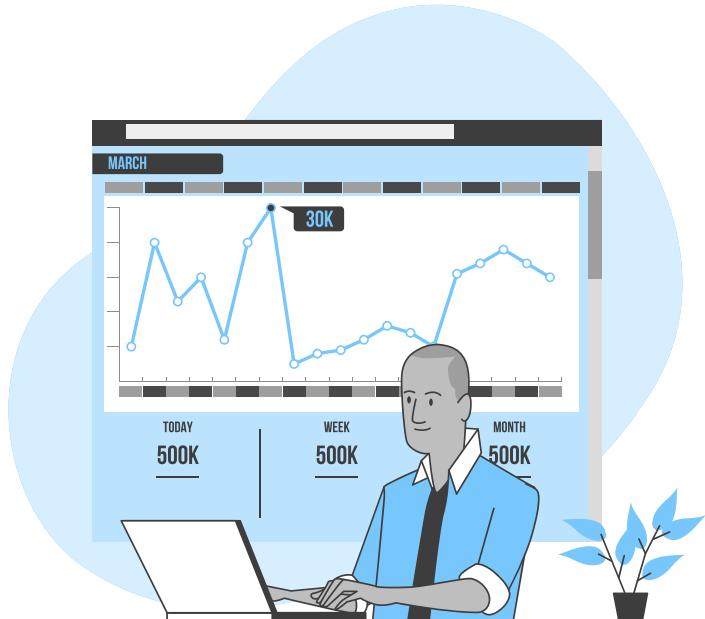
Phase 1



Phase 2



The Slide Title Goes Here!



Do you know what helps you make your point clear? Lists like this one:

- They're simple
- You can organize your ideas clearly
- You'll never forget to buy milk!

And the most important thing: the audience won't miss the point of your presentation

A Picture Is Worth a
Thousand Words



Infographics Make Your Idea Understandable...

Mercury

Mercury is the closest planet to the Sun

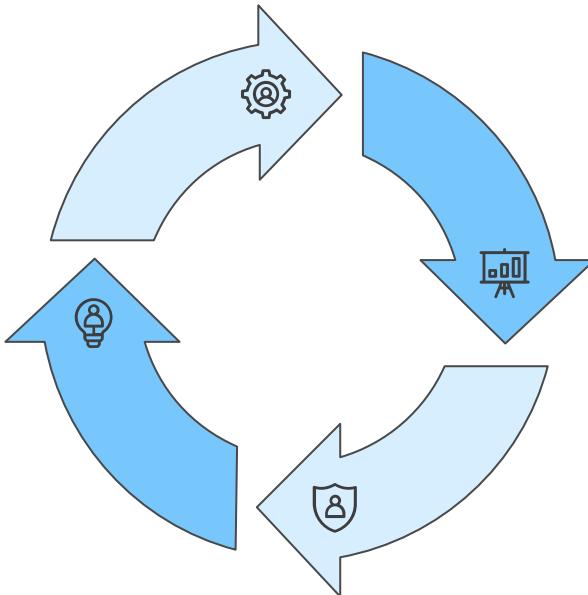
Jupiter

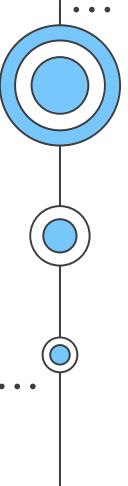
Jupiter is the biggest planet of them all

Neptune is the farthest planet from the Sun

Saturn

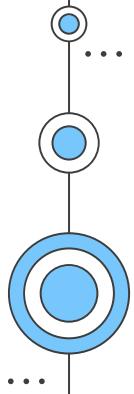
Saturn is the ringed one and a gas giant





...And the Same Goes for Tables

	Mass (earths)	Diameter (earths)	Gravity (earths)
Mercury	0.06	0.38	0.38
Mars	0.11	0.53	0.38
Saturn	95.2	9.4	1.16



Maybe You Need to Divide the Content

01

Neptune

Neptune is the farthest planet from the Sun and the fourth-largest in the Solar System

02

Jupiter

Jupiter is the biggest planet in the Solar System and the fourth-brightest one

Desktop Software

You can replace the image on the screen with your own work. Just delete this one, add yours and center it properly



Thanks!

Do you have any questions?

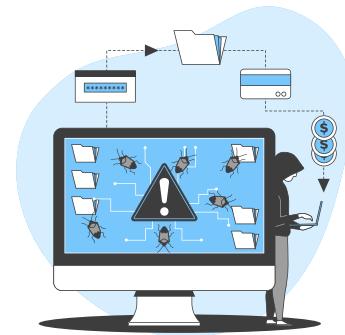
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- Close-up of woman using a laptop
- Beautiful young woman holding laptop on pink backdrop

Icons

- Project Management Icon

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Pana



Amico



Bro



Rafiki

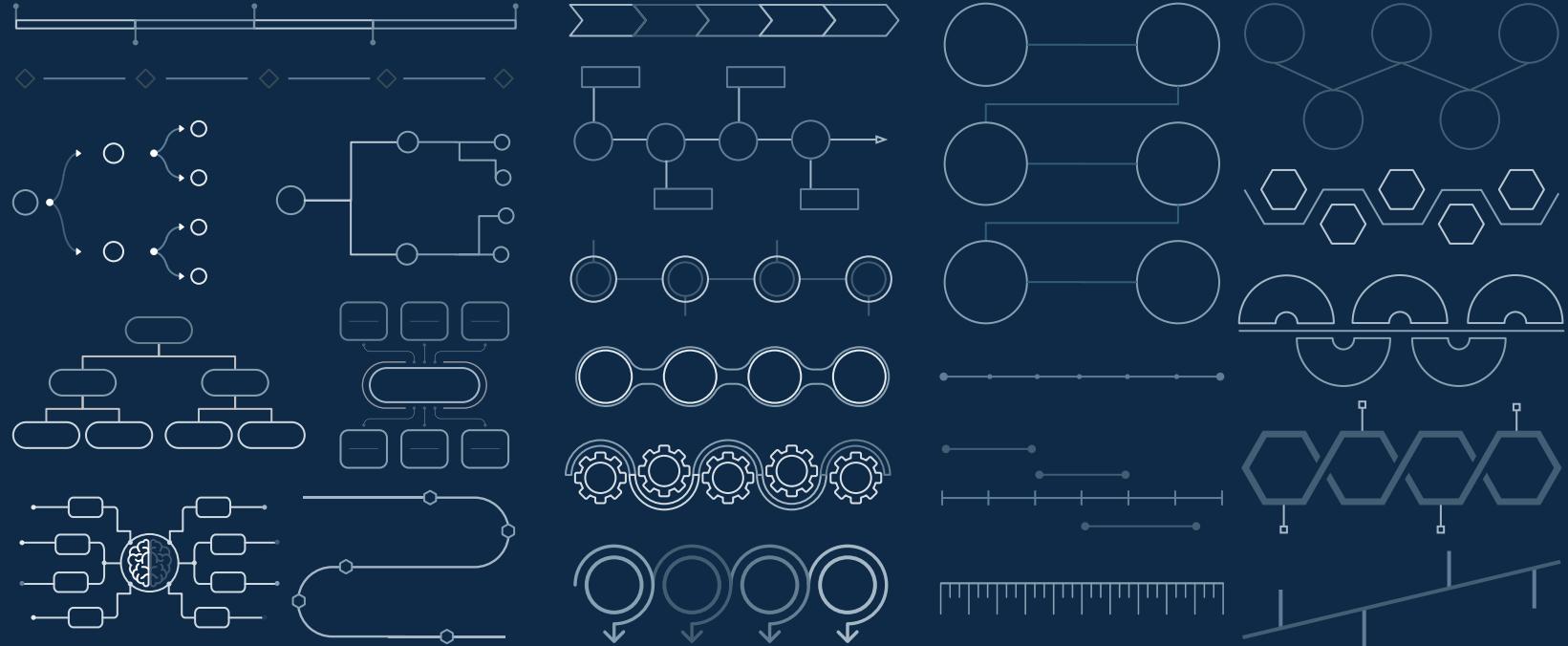
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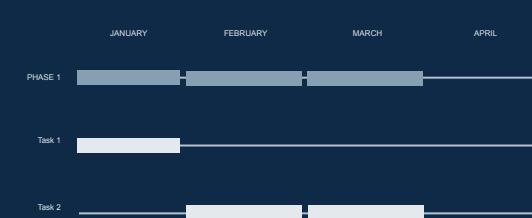
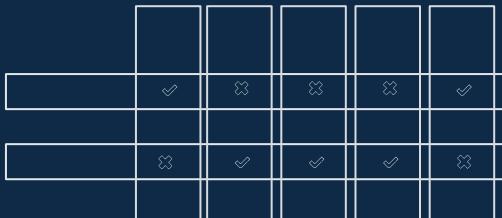
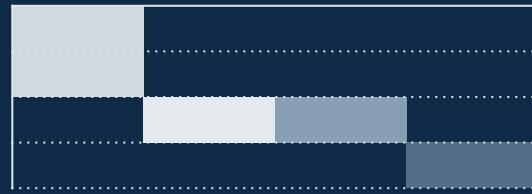
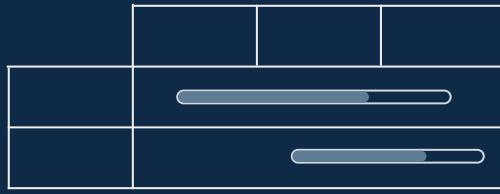
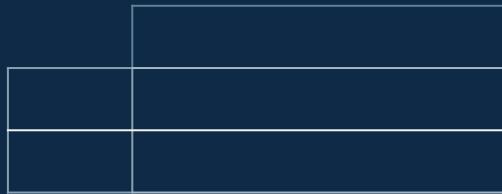
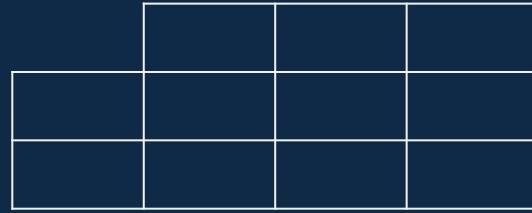
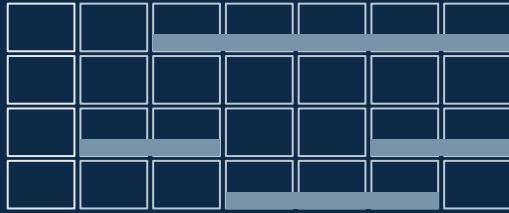
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Group the resource again when you're done. You can also look for more infographics on Slidesgo.

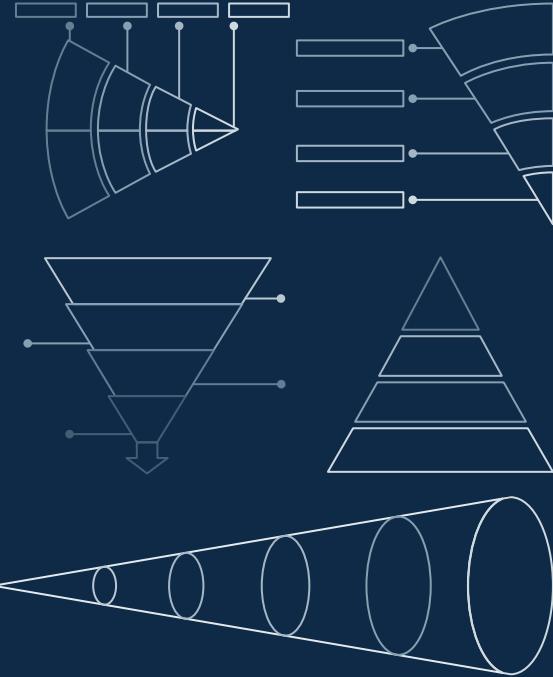
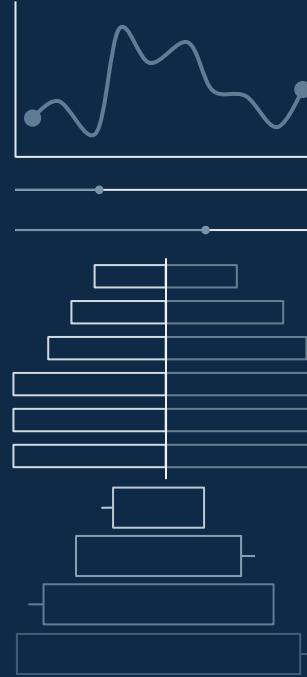
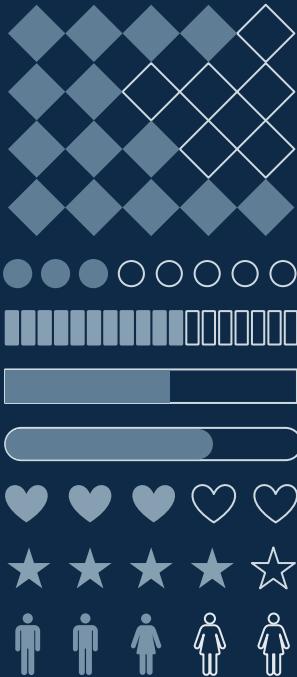
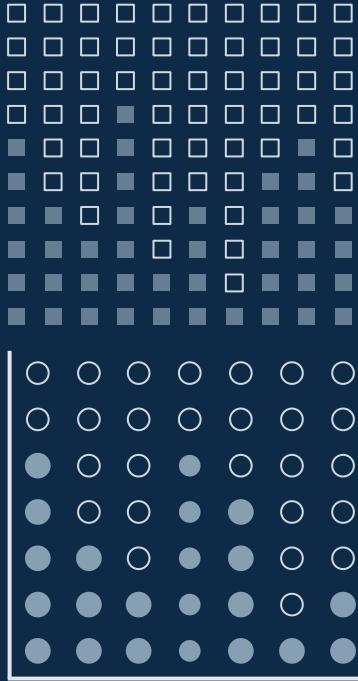












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Educational Icons



Medical Icons



Business Icons



Teamwork Icons



Help & Support Icons



Avatar Icons



Creative Process Icons



Performing Arts Icons



Nature Icons



SEO & Marketing Icons



