

# Buy Now Pay Later

INDUSTRIAL PROJECT GROUP 9

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# OUR TEAM



Do Nhat Anh Ha (Skye)



Alistair Cheah Wern Hao

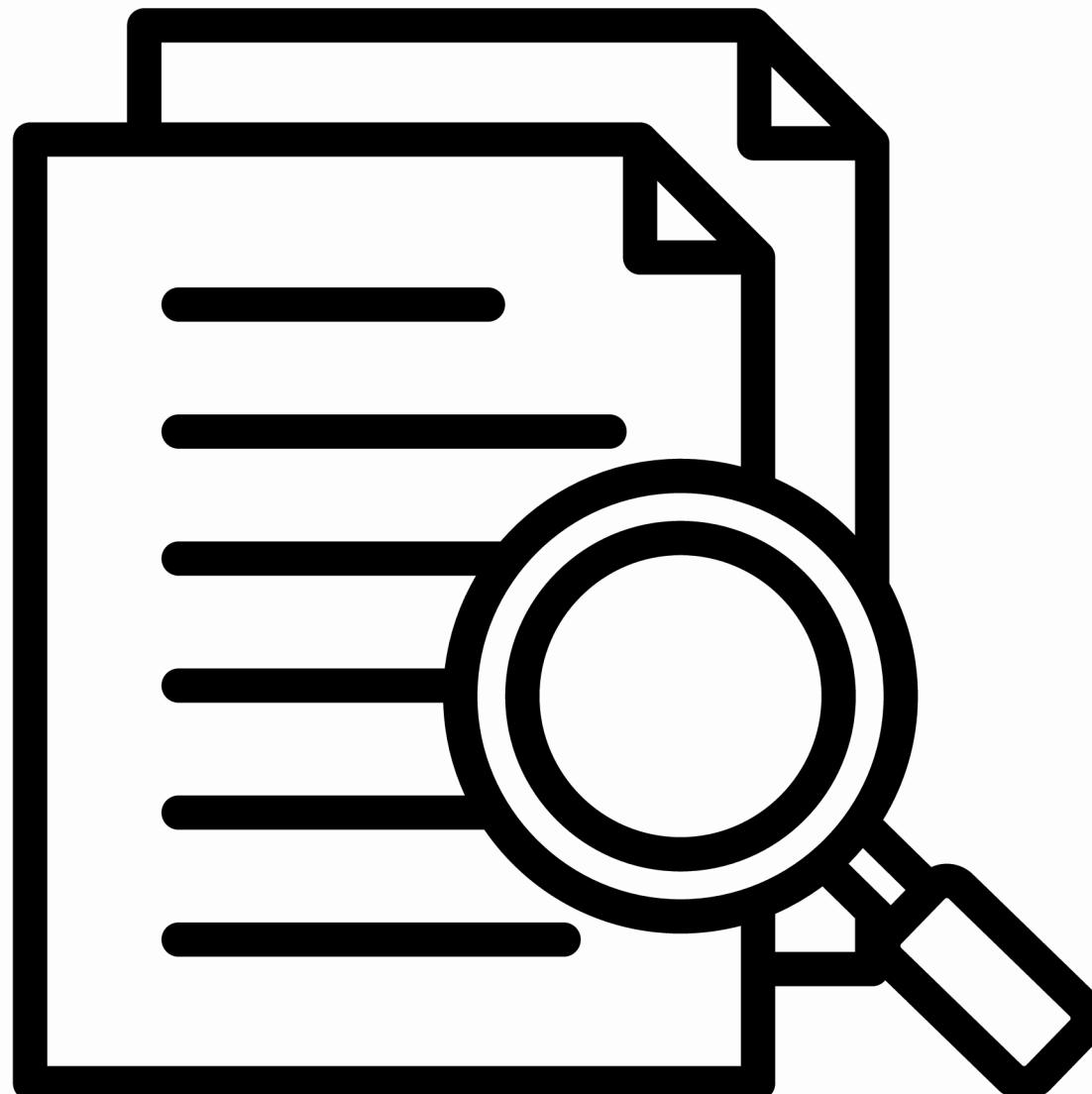


Sitao Qin (Alex)



Shiping Song

# PROJECT OVERVIEW



A ***Buy Now Pay Later (BNPL) firm*** is introducing a new purchasing feature: “**Pay in 5 installments**”.

**How it Works:** The BNPL firm pays the merchant upfront, allowing the customer to repay the amount in 5 interest-free installments.

**Business Model:** The firm earns revenue by taking a percentage of each transaction from the merchant (known as the **take rate**).

# B E N E F I T S



## INCREASED SALES

Attract more customers and encourage spending more



## INSTANT PAYMENT

Receive payments upfront from BNPL firm

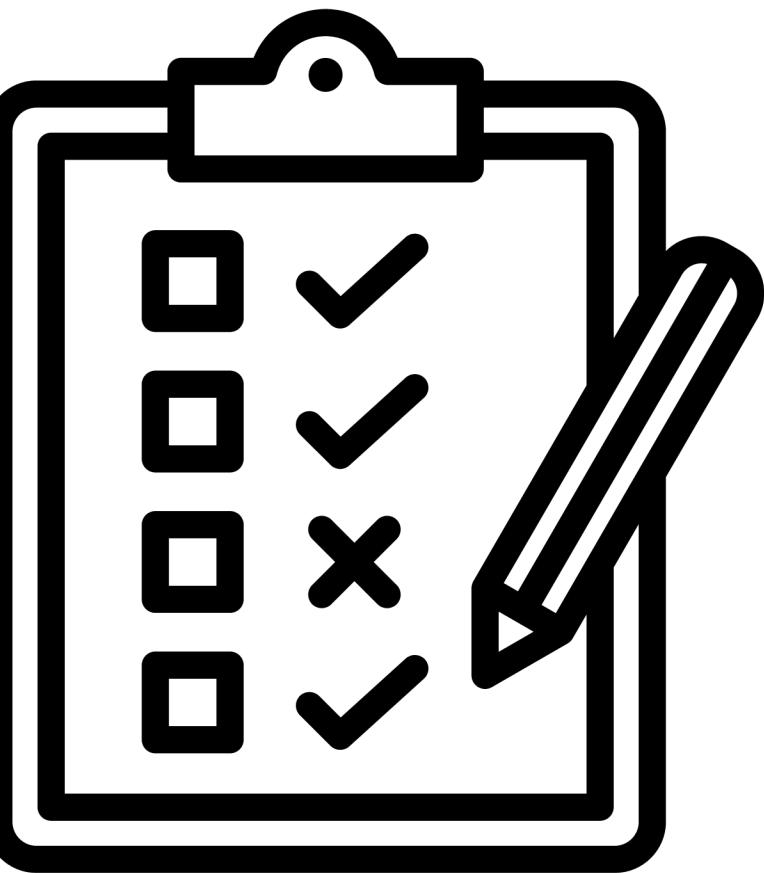
# THE PROBLEM

Limited resources restrict the number of merchants the firm can onboard.  
Leading to the question

***"What are the top 100 merchants to choose?"***

Our project goal is to answer the above question using a ***Ranking System*** that  
***efficiently identify the top merchants***, accounting for  
***merchant's characteristics.***

# **WHAT MAKES A GOOD MERCHANT?**



## **REVENUE**

Higher merchant's revenue means higher profit for the firm

## **GROWTH**

Higher growth rate leads to more profit for the firm

## **SALES STABILITY**

Must have sales within 15 months up to the last date of transaction in data

## **ORDER VOLUME**

Larger custom base and more revenue potential

# FRAUD EXPOSURE

## Merchant Scam

- Undermine trust
- Harm profitability

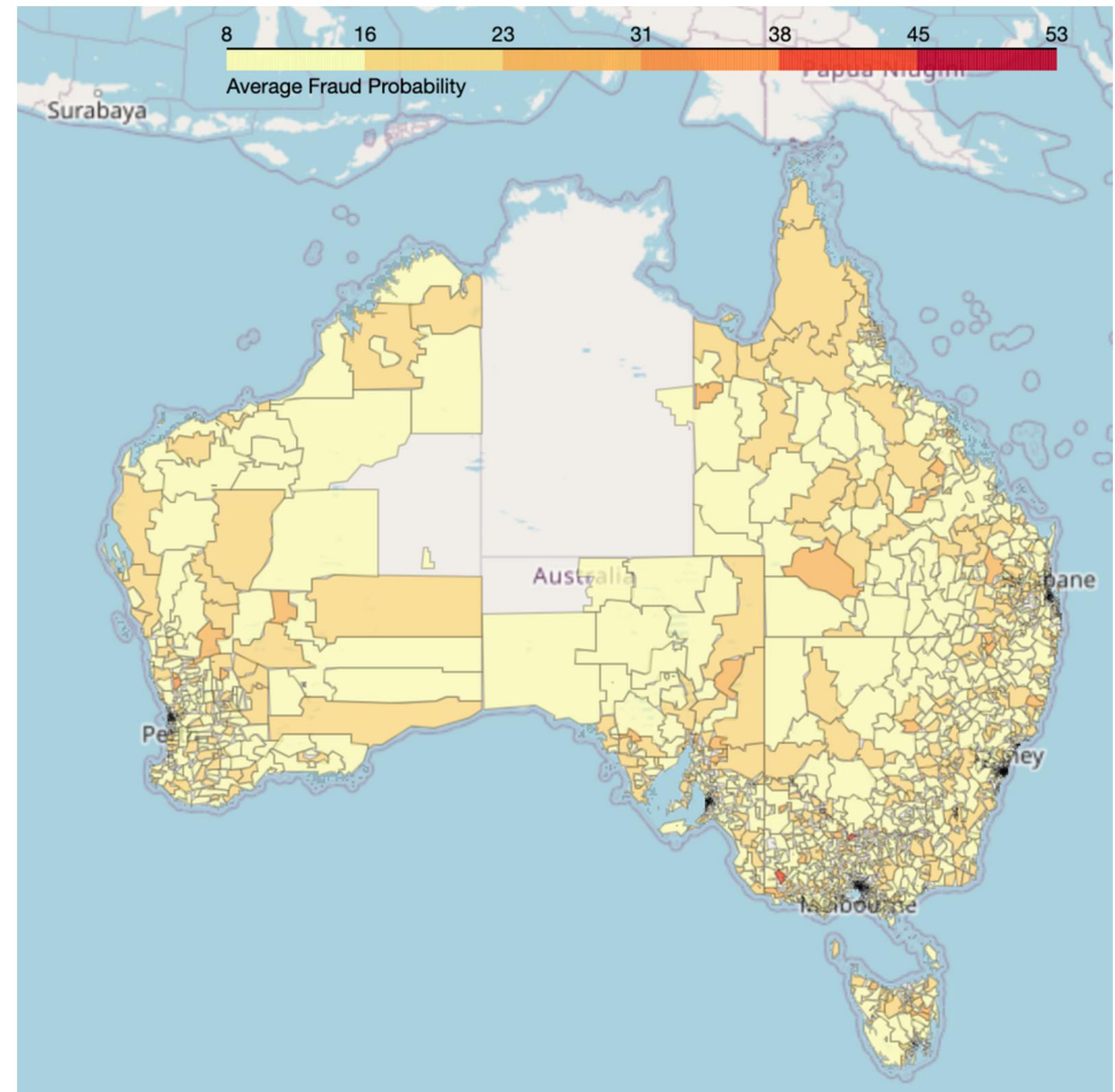
## Consumer Scam

- Financial losses
- Operational costs

# GEOSPATIAL ANALYSIS

## *Consumer Fraud Probability*

- Each block represents a specific postcode.
- Significant distinct average fraud probabilities at the postcode level.



**Consumer's average fraud probability in each state**

# FINAL FACTORS FOR FORECASTING FRAUD PROBABILITY

## Transaction Value

- Identification of monetary patterns of each transaction.

## Transaction Activity Level

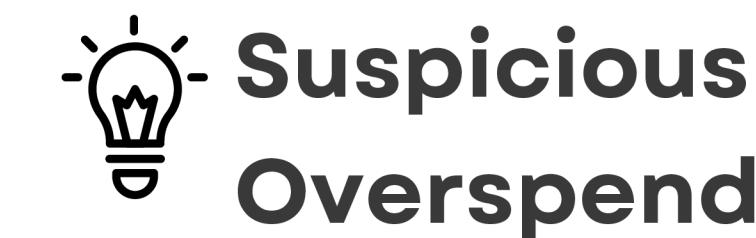
- Monthly order volume.

## Time-Based Patterns

- Temporal trends in transaction data.

## Geographic Context

- Average income and fraud rates by postcode.



## Each transaction

Forecasting scam rate of consumer and merchant on this transaction

Linear  
Regression

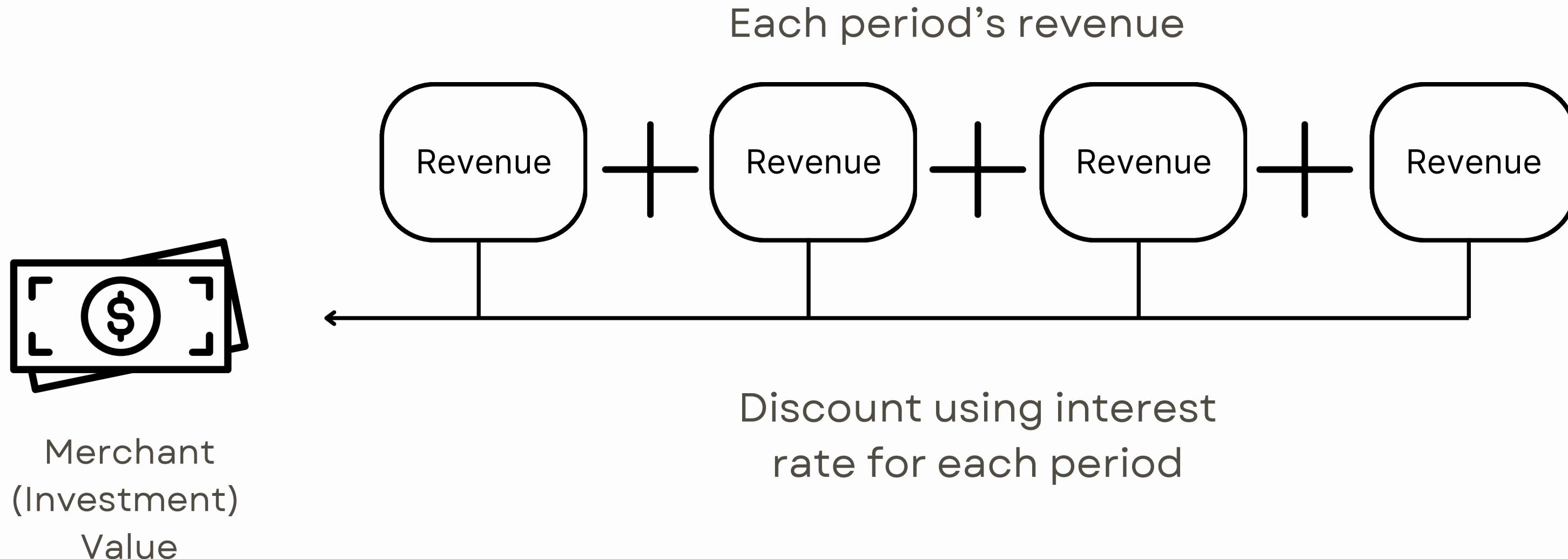
Random  
Forest  
Tree

# **HOW WE RANK THE MERCHANTS?**



We adopted the point of view of a **Finance Project Manager** and treated each retailer as an *investment* that generates *cash flows* for the BNPL firm.

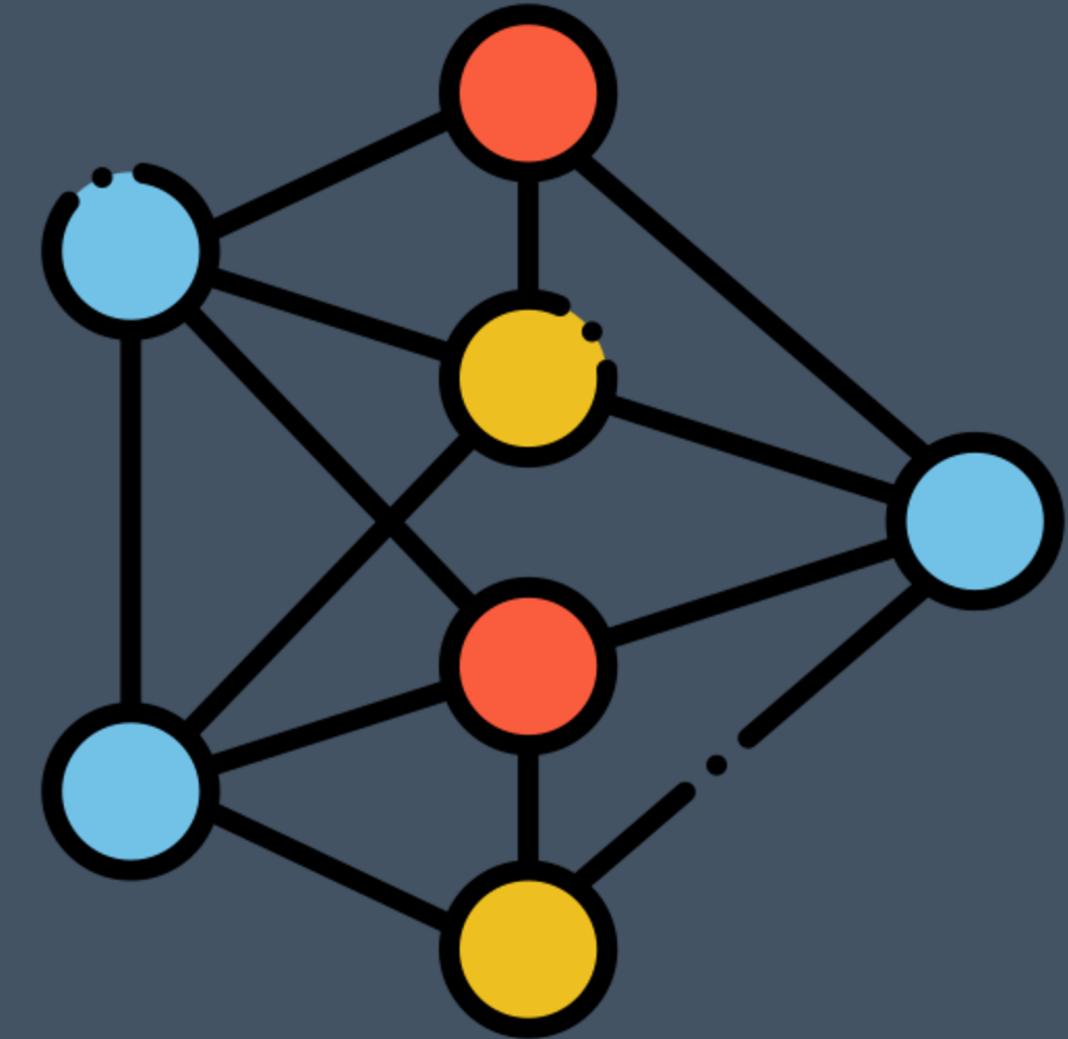
We used **Discounted Cash Flow (DCF)** model, a basic method for estimating the total revenue of an investment using **future periodically cash flows**.





## GROWTH RATE

Multiply final month's revenue  
by average monthly growth rate



## NEURAL NETWORKS

Use Long Short Term Memory  
to forecast future revenues



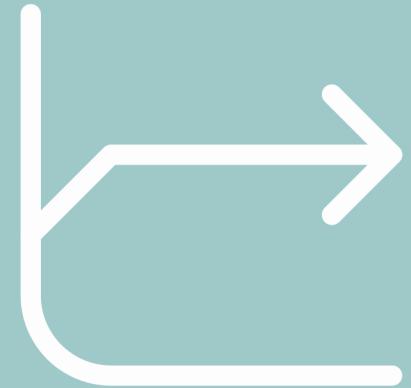
## TAKE RATE

Take rate varies by merchant and directly determines how much of their revenue goes to the firm, making it crucial to consider.



## COMBINED FRAUDULENT RISK

Higher fraudulent risk means higher chance of revenue loss.



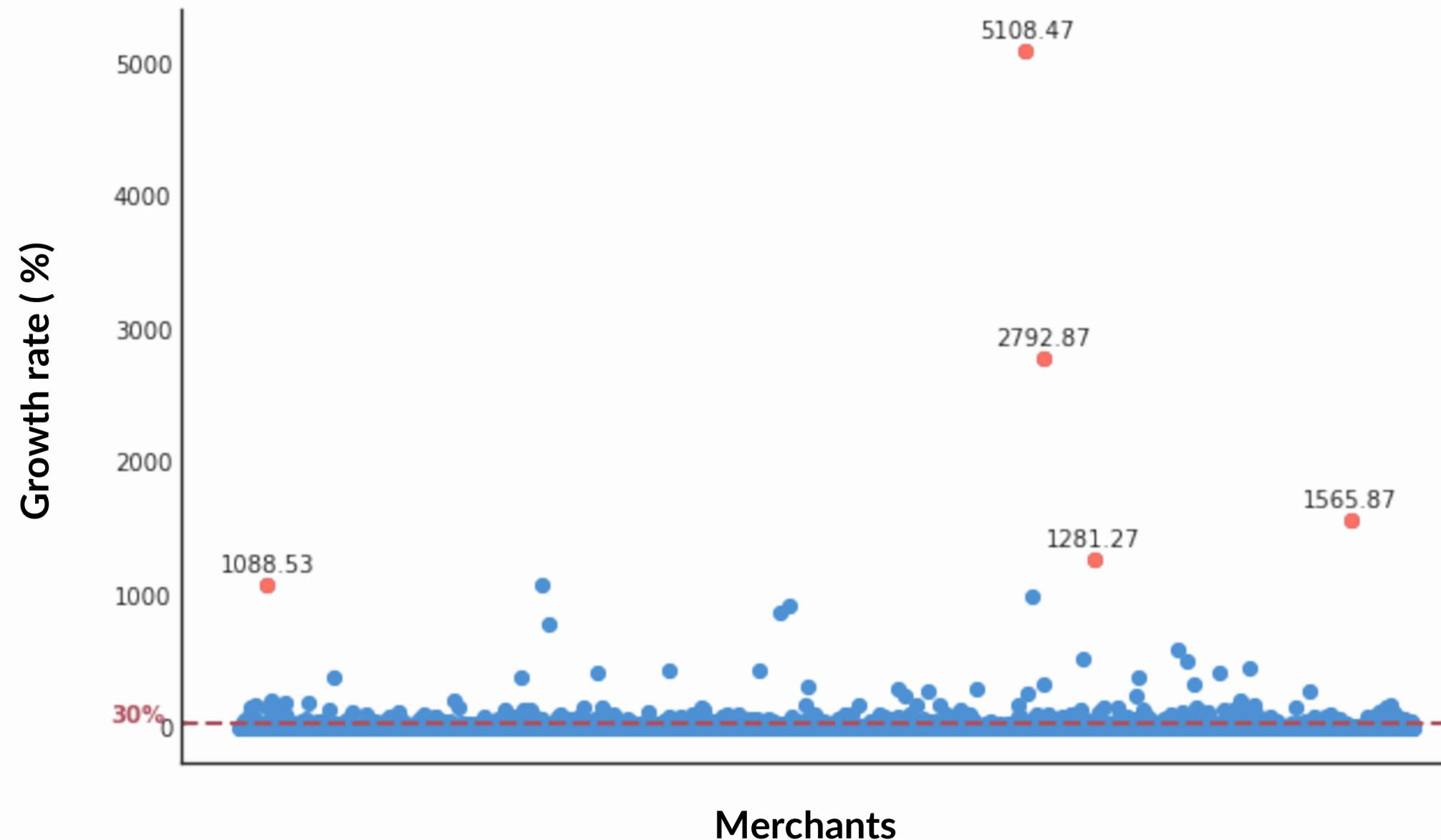
## ORDER VALUE STABILITY

Stable value per order indicates stable cash flow per order for BNPL firm.

# MERCHANT VALUE ADJUSTMENTS BASED ON CHARACTERISTIC

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Merchants' Average Monthly Revenue Growth Rate

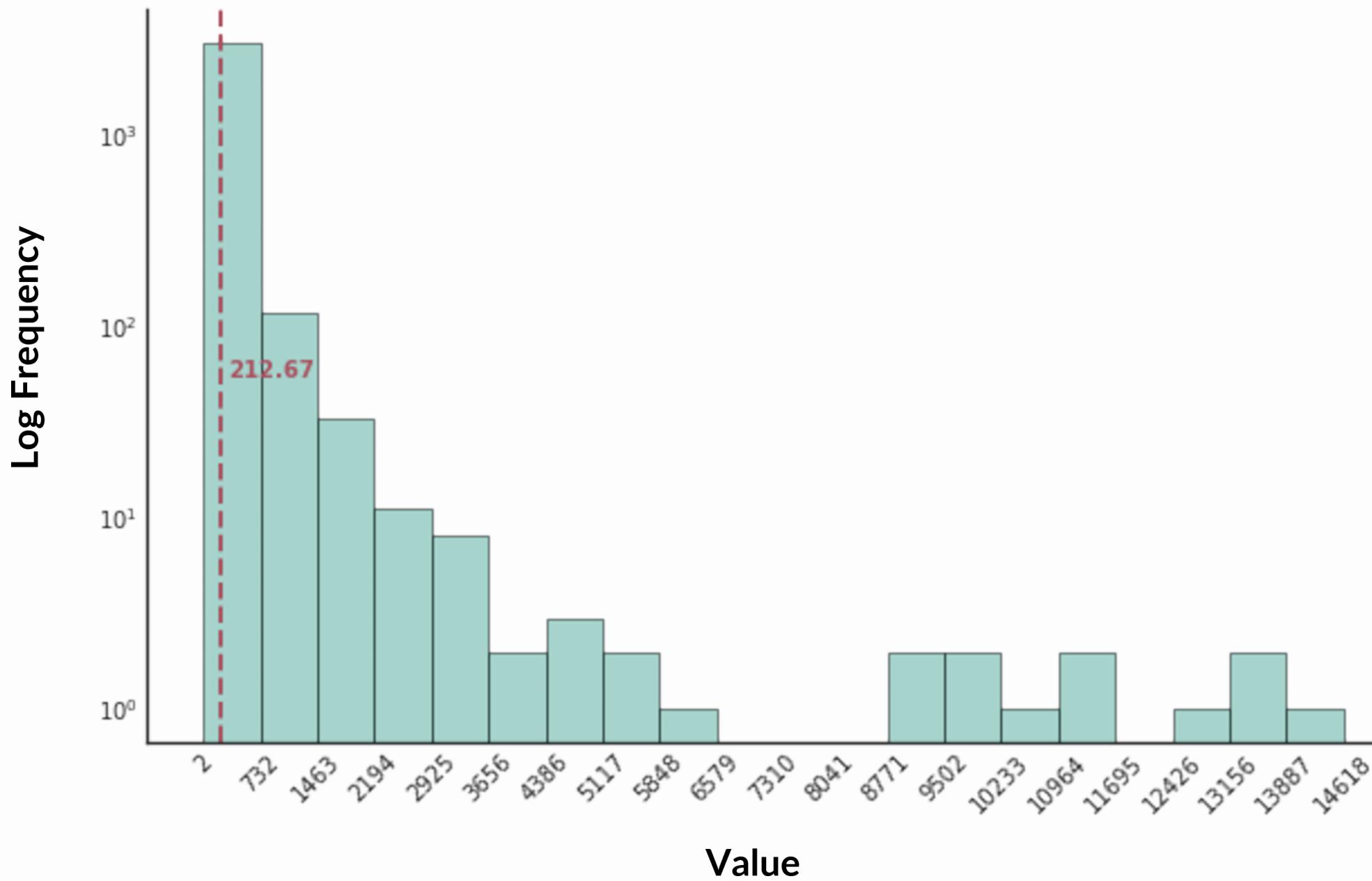


## MERCHANT'S GROWTH STABILITY

Stable monthly growth rate allows realistic revenue forecast.

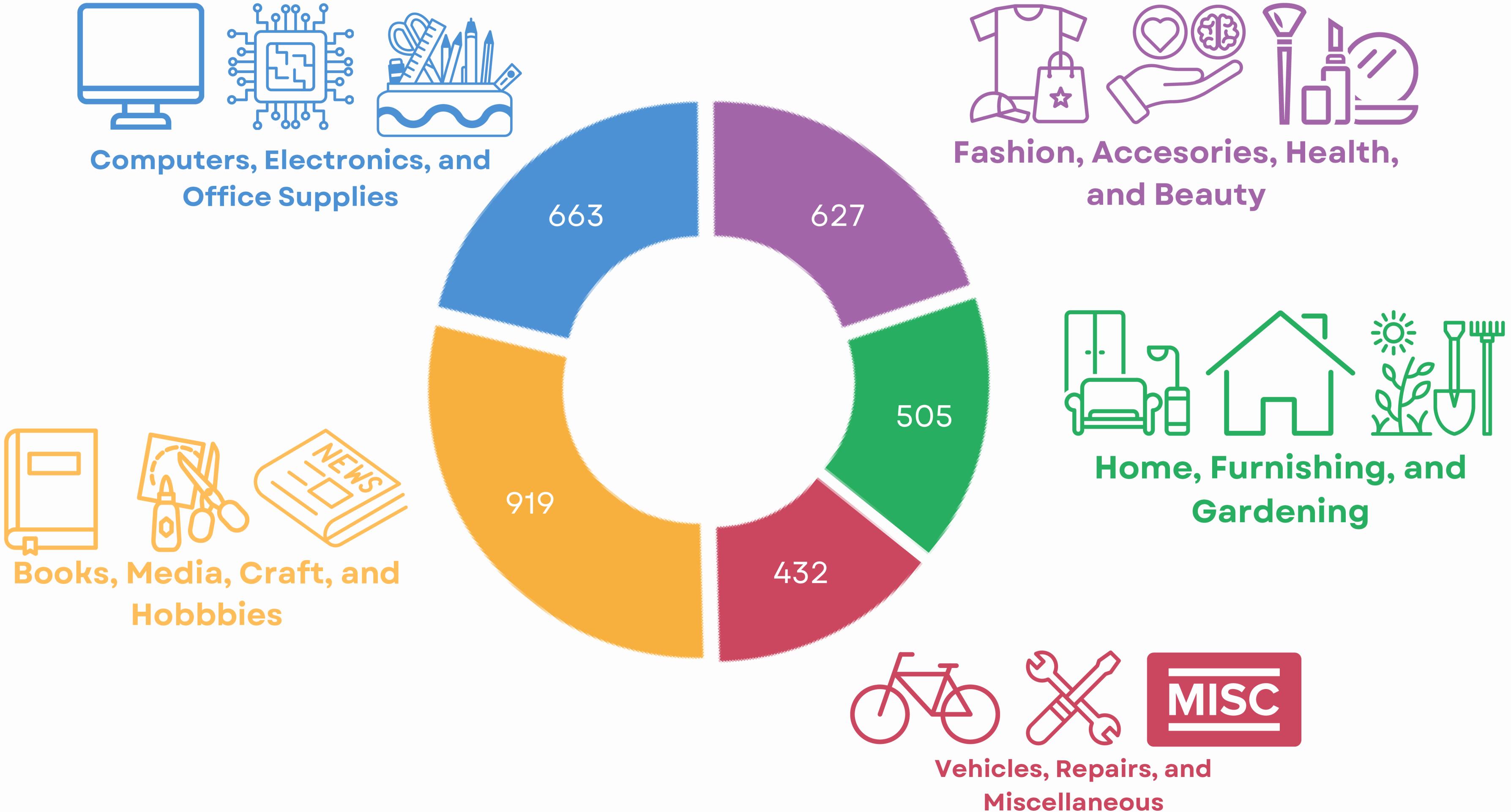
# MERCHANT VALUE ADJUSTMENTS BASED ON CHARACTERISTIC

Merchants' Order Volume Histogram

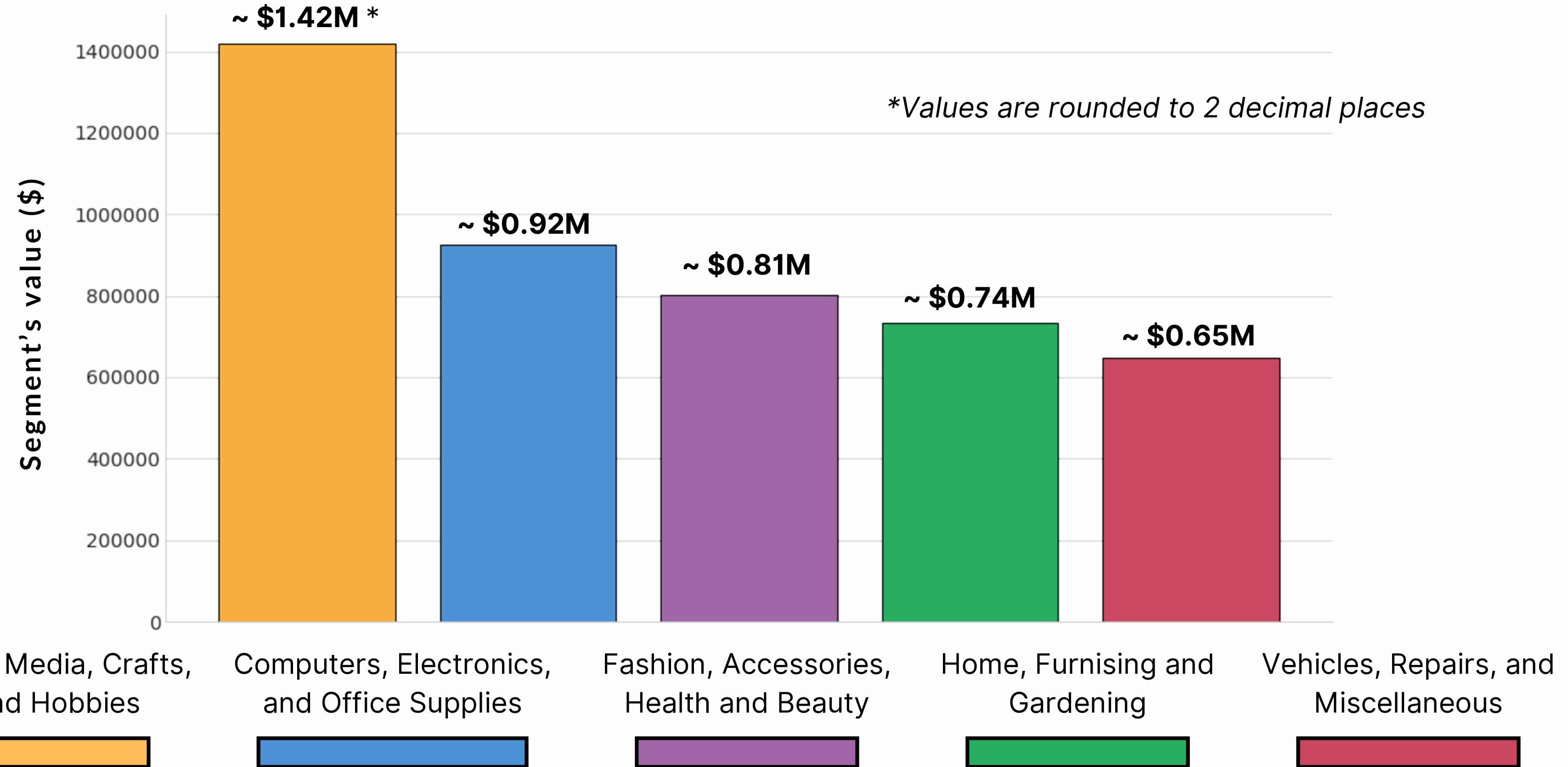


**HIGH ORDER VOLUME**

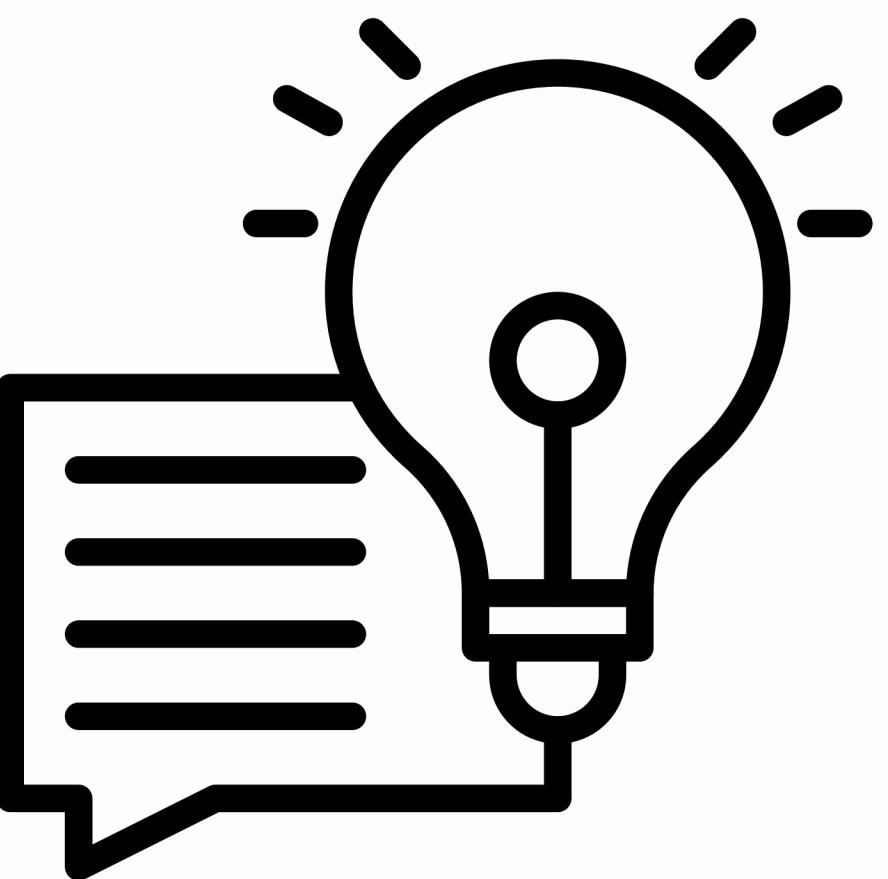
More orders mean more cash flow for the BNPL firm.



# Total Estimated Value of Segments



# RECOMMENDATIONS



# BEST PERFORMING MERCHANTS

## HOME, FURNISHING, AND GARDENING

Amet Risus Inc.	\$50,753
Phasellu At Limited	\$39,744
Lorem Ipsum Sodales Industries	\$37,023

## COMPUTERS, ELECTRONICS, AND OFFICE SUPPLIES

Mauris Non Institute	\$50,237
Nec Incorporated	\$47,340
Arcu Sed Eu Inc.	\$40,682

## VEHICLES, REPAIRS, AND MISCELLANEOUS SERVICES

Ornare Limited	\$49,906
Etiam Bidendum Industries	\$49,510
Est Nunc Consulting	\$47,880

## BOOKS, MEDIA, ARTS, CRAFTS, AND HOBBIES

Orci In Consequat Corporation	\$53,912
Lacus Consulting	\$51,485
Lobortis Ultrices Company	\$49,691

## FASHION, PERSONAL ACCESSORIES, HEALTH, AND BEAUTY

Dignissim Maecenas Fondation	\$54,713
Leo In Consulting	\$54,579
Gravida Mauris Inc.	\$45,390

# HOW OUR SYSTEM BENEFITS BUSSINESSES



## Clear and Accessible Results

The outcome is straightforward;  
Easy to understand rankings



## Efficient Merchant Ranking

Quickly identifies top-  
performing merchants



## Scalability

Scalable for larger firms and new  
merchants.

# **PROJECT EVALUATION**

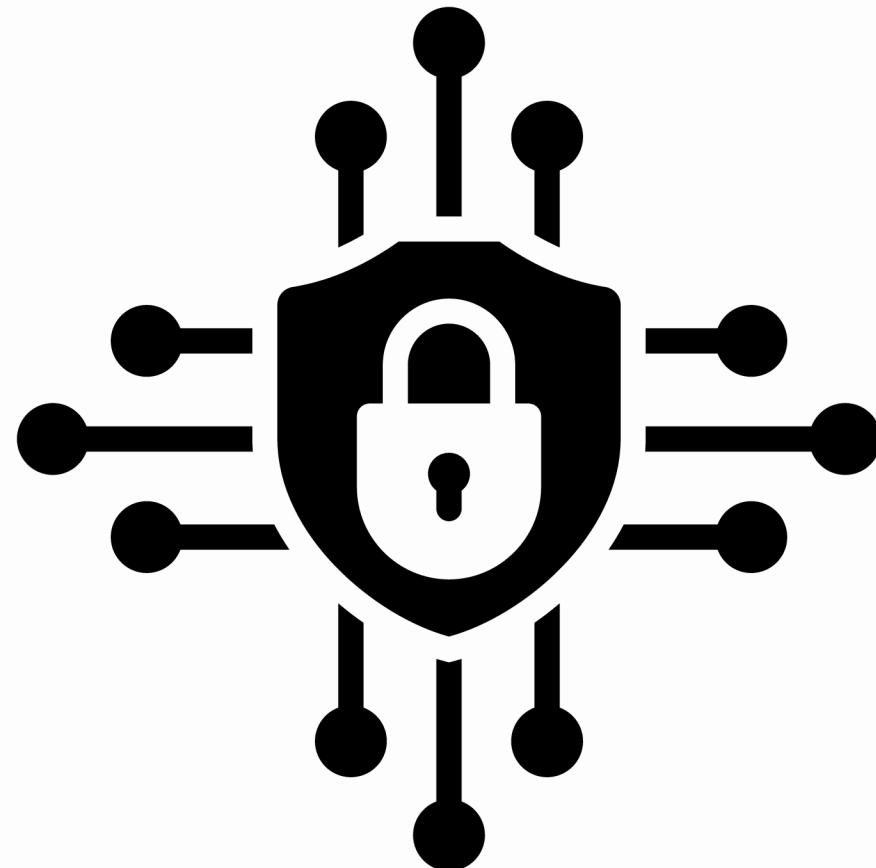
# LIMITATIONS



Poor data quality and low data availability



Lack of merchant's business information



# DATA SECURITY

*All data regarding transactions, merchant and consumer information are stored offline on local machines.*

*Only external datasets are store on Github repository*

- 
- Week 1** - Data Collection, ETL Pipeline, Preliminary Analysis ~ 15 hours
  - Week 2** - Outlier Analysis, Geospatial Analysis, Visualisation ~ 17 hours
  - Week 3** - Modelling Fraud Probabilities ~ 14 hours
  - Week 4** - Features and Heuristics Engineer for Ranking System ~ 14 hours
  - Week 5** - Assigning Merchants Into Segments ~ 3 hours
  - Week 6** - Finalise Ranking System and Identify Top 100 Merchants ~ 12 hours

## PROJECT TIMELINE

*Communication and meetings  
via Tutorials and Discord*

**SUPPORT US**



*Is the project worth pursuing given the amount of work taken?*

*How does your groups' current progression support this?*

*How long would it take to deliver an actual product?*

**THANK YOU FOR  
LISTENING!**