



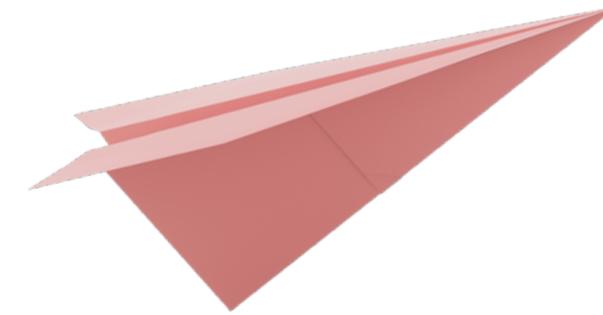
Portofolio

'CRR'

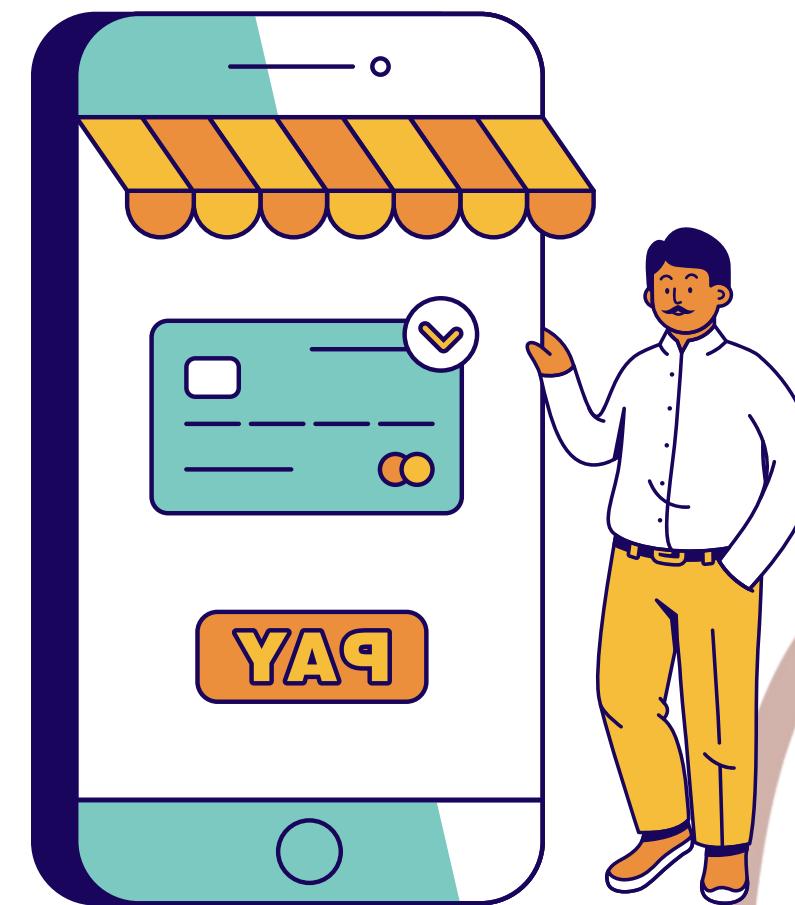
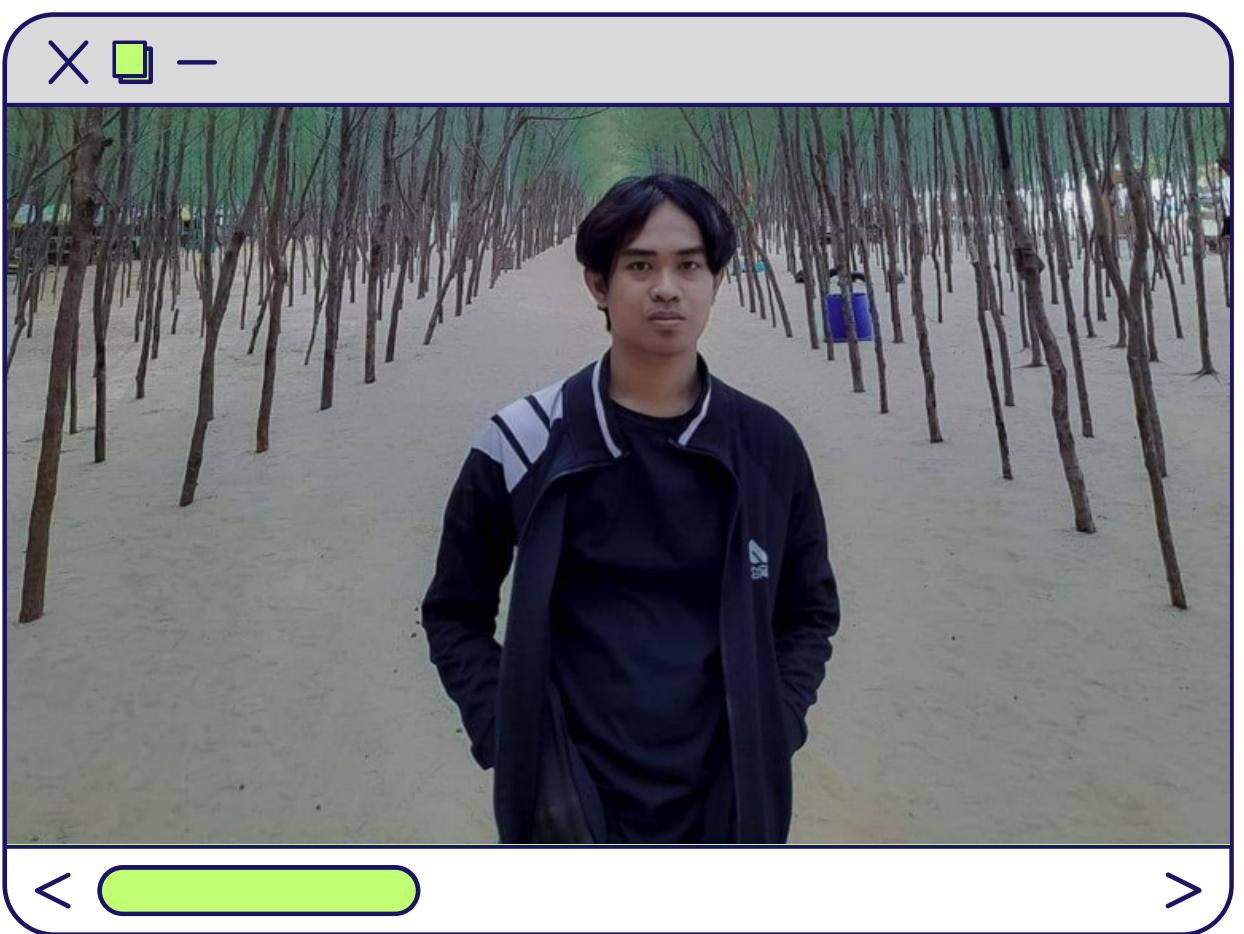
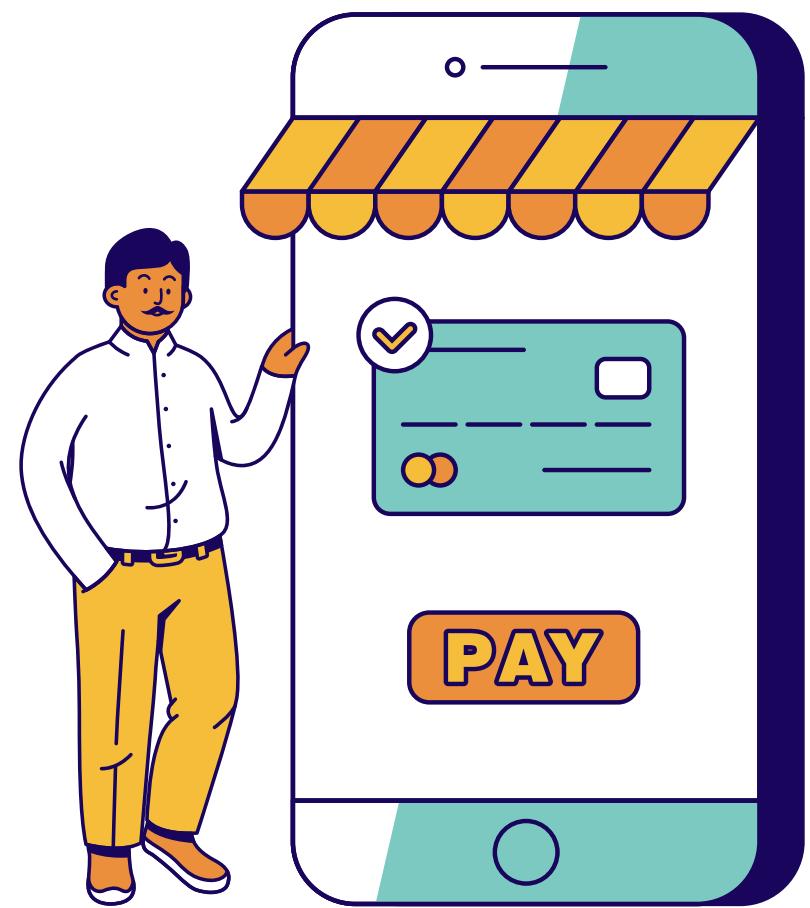
E-COMMERCE SHIPPING

Meningkatkan Profit
Perusahaan dengan
Customer Retention Rate
(CRR)

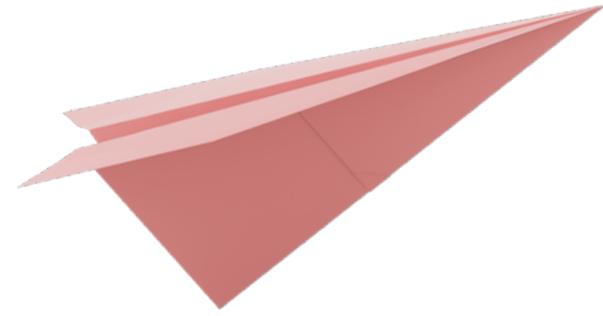




Data Scientist



Yudhi Ahmadi



01

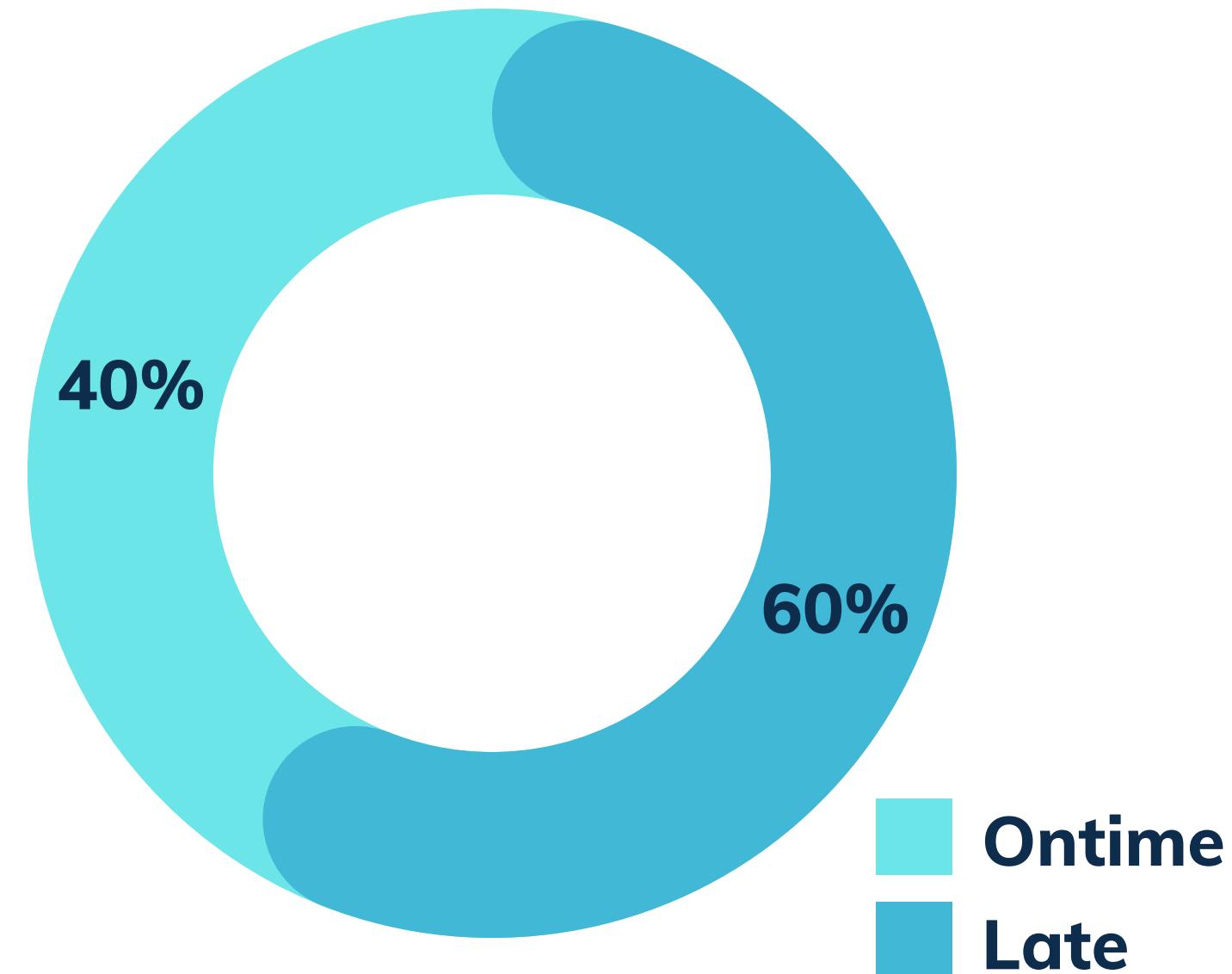
Background



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Percentage of Reached On Time



Persentase pengiriman barang mengalami **keterlambatan lebih besar dibandingkan pengiriman tepat waktu**



REPORT : US CONSUMER ARE RELUCTANT TO ORDER MISSION-CRITICAL ITEM FOR DELIVERY

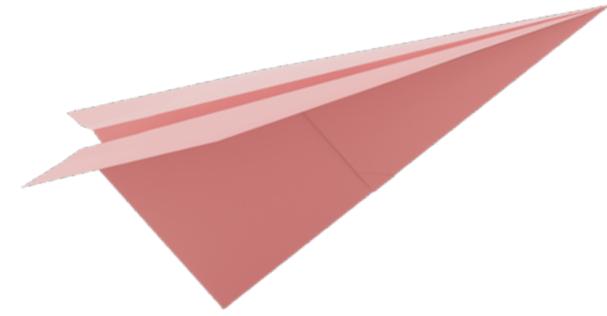
Akibat pengiriman yang terlambat :

- 34 % pelanggan menghindar untuk melakukan order lagi
- 19% pelanggan memberitahu kerabatnya untuk tidak menggunakan jasa perusahaan tersebut



Kalau begini terus
bisa bisa toko kita
semakin sepi ???





02

Goals



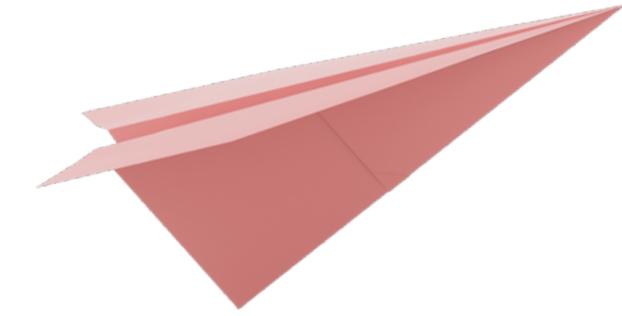
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GOALS :

Meningkatkan Customer Retention Rate (CRR)
untuk meningkatkan Profit Perusahaan





03

Business Metrics & Objective



Business Metrics

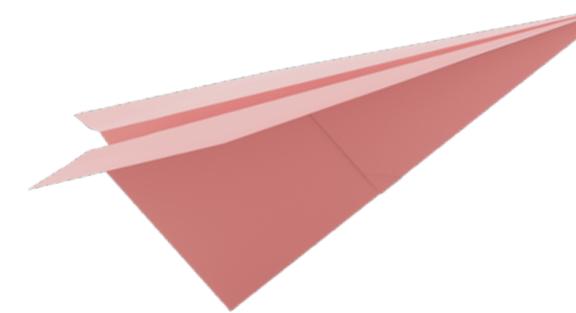
- % Reached on Time
- % Customer Retention Rate



Objectives :

- Prediksi pada keterlambatan pengiriman barang
- Pemberian voucher diskon bagi pengiriman yang telat
- Mengetahui nilai kenaikan Customer Retention Rate (CRR)





04

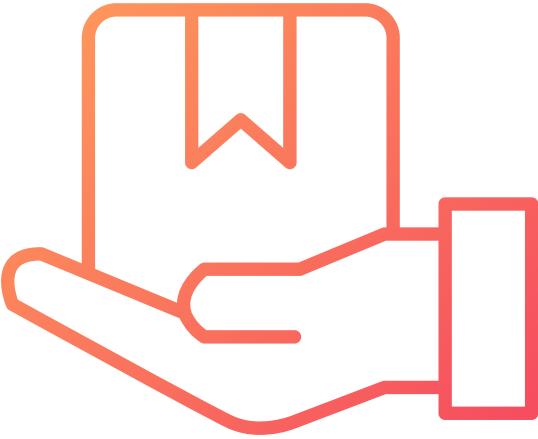
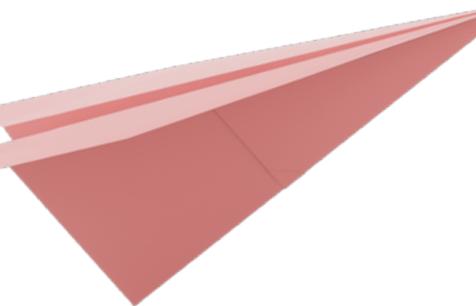
EDA &

Machine Learning



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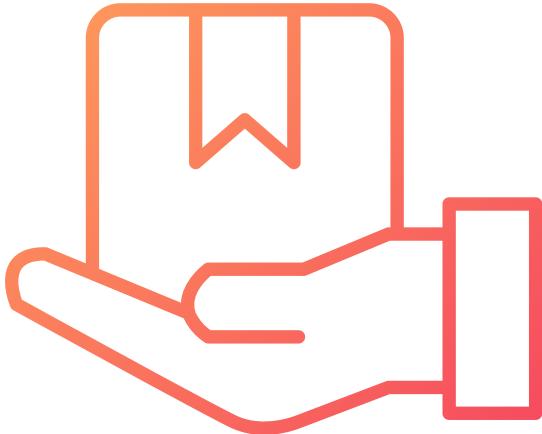
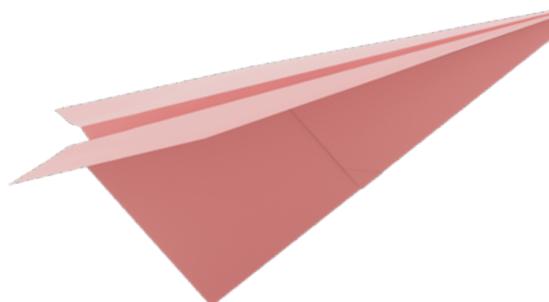




Dari hasil EDA:
Adanya,

- penumpukan barang di Blok F
- Barang yang telat lebih banyak daripada barang yang Ontime (Not Late)





Machine Learning Evaluation

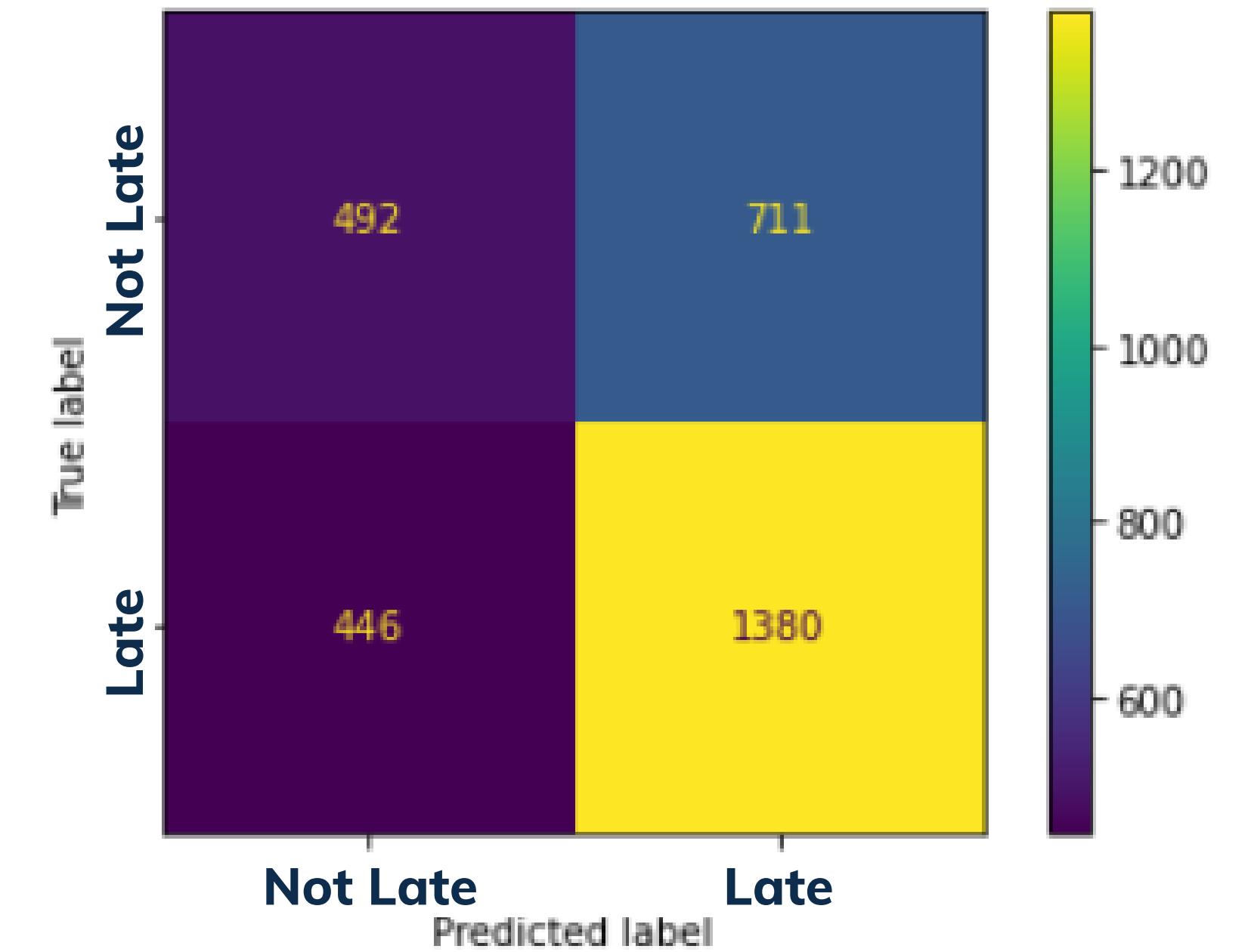
| Model | Accuracy | Precision | Recall | F1-Score |
|---------|----------|-----------|--------|----------|
| KNN | 0,67 | 0,81 | 0,58 | 0,68 |
| DT | 0,66 | 0,75 | 0,64 | 0,69 |
| RF | 0,68 | 0,92 | 0,51 | 0,65 |
| Gboost | 0,65 | 0,72 | 0,67 | 0,70 |
| NBC | 0,66 | 0,94 | 0,46 | 0,62 |
| XGboost | 0,62 | 0,66 | 0,76 | 0,70 |

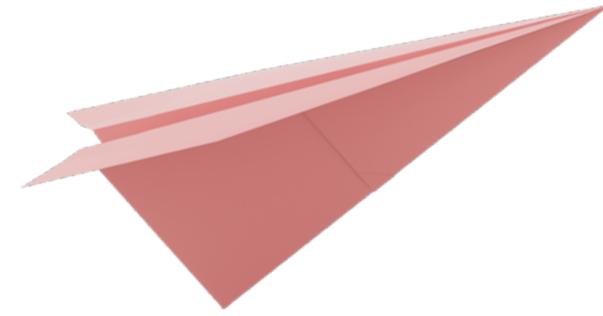
Didapatkan Model XGboost yang mempunyai nilai rata-rata evaluasi paling tinggi.

Machine Learning Evaluation

Berdasarkan Hasil Confussion Matrix pada Model Random Forest, Terlihat nilai **TP 492**, dan **FP 711**. Kedua nilai ini digunakan untuk perhitungan precision not late.

$$Precision = \frac{True\ Positive}{True\ Positive + False\ Positive}$$





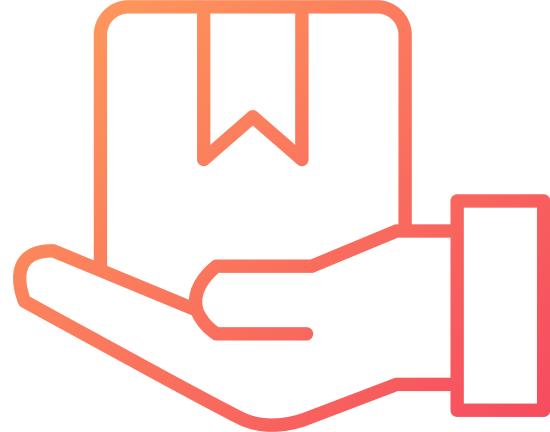
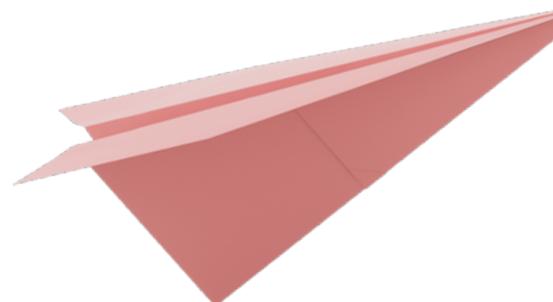
05

Simulation & Business Recommendation

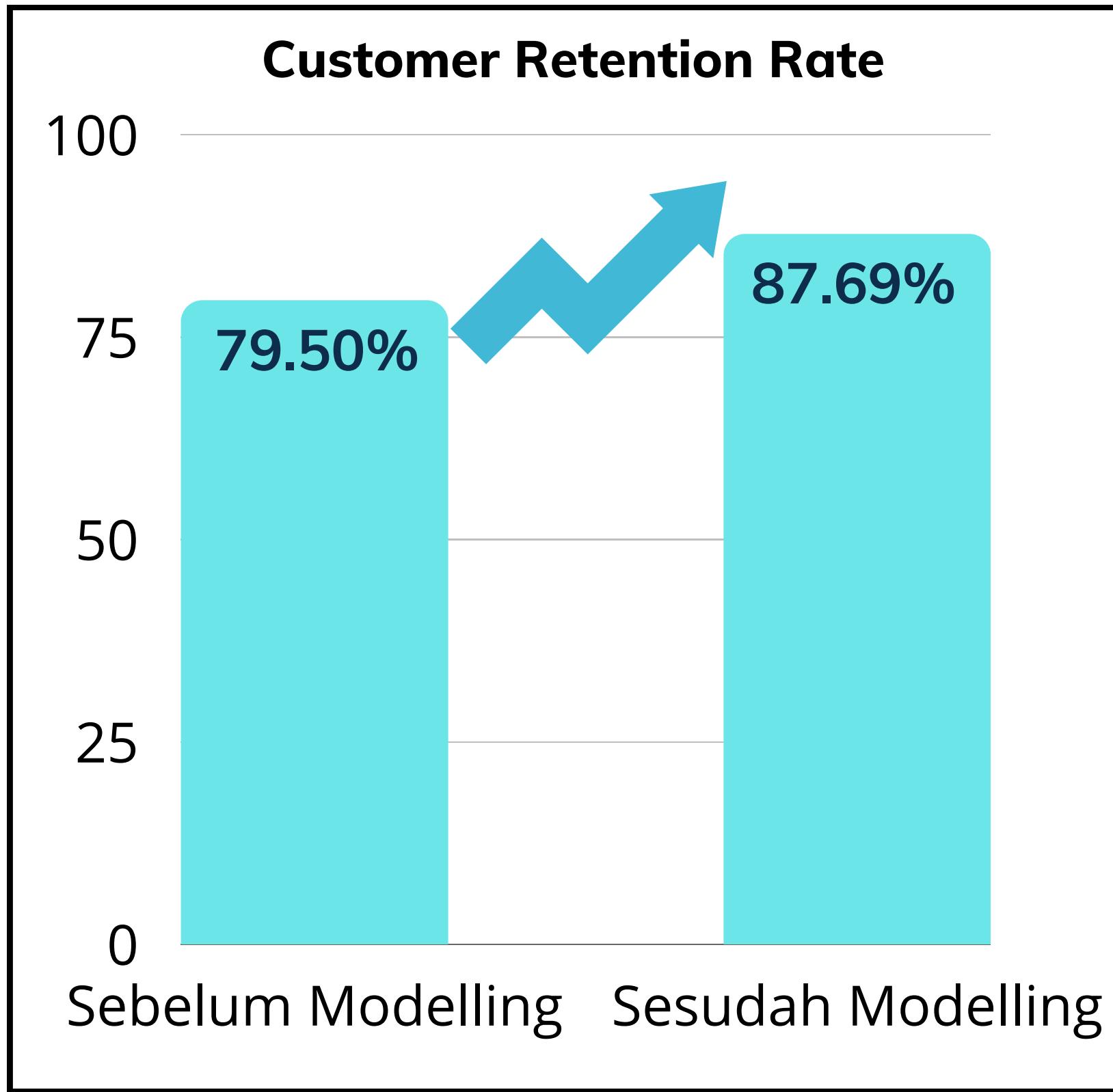


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Perhitungan Customer Retention Rate



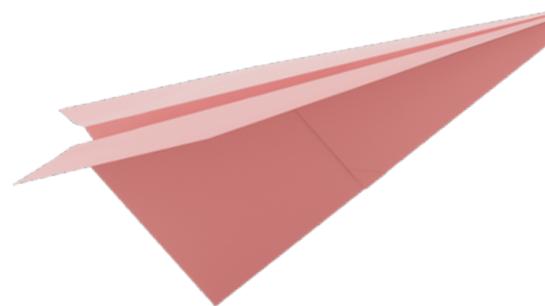
$$[(CE-CN)/CS] \times 100 = \text{Customer Retention Rate}$$

the number of new customers acquired during the period
↓
CE - Customer End
CN - Customer New
↑
the number of customers at the end of the period
↑
the number of customers at the start of the period
CS - Customer Start

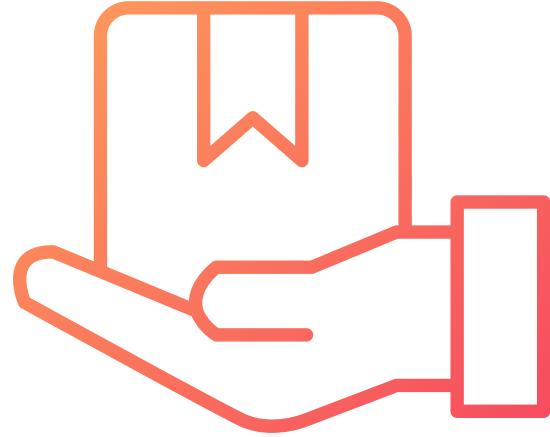
Sebelum Modelling
Asumsi 34% pelanggan tidak order lagi*

Setelah Modelling
(Presisi telat 60%) Asumsi pemberian diskon meningkatkan 25% CLV**

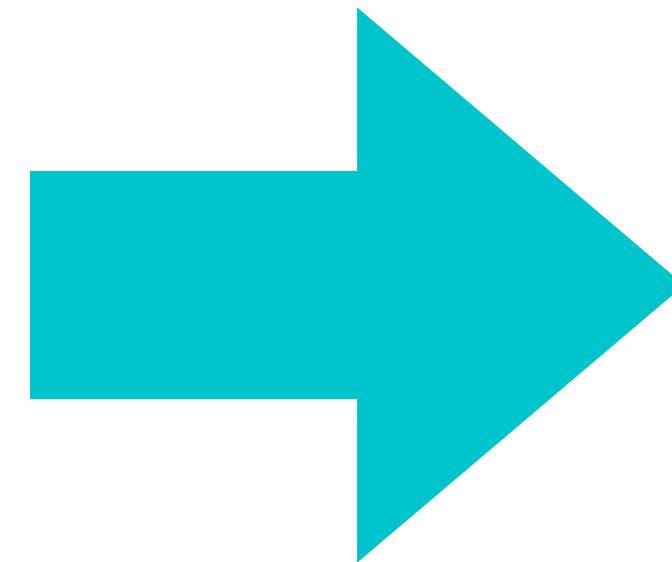
- Source :
- *SupplyChainBrain
 - **cmswire



Pengaruh Peningkatan Customer Retention Rate



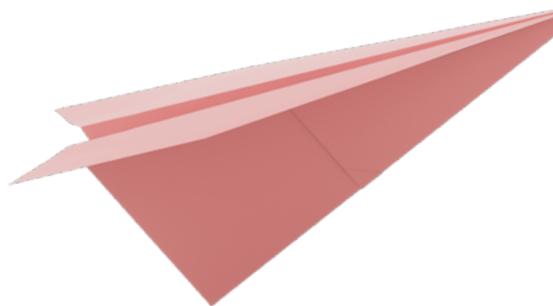
8.19%
Peningkatan CRR



>25%
Profit Perusahaan

Peningkatan CRR 5% diasumsikan dapat meningkat profit perusahaan minimal 25%*

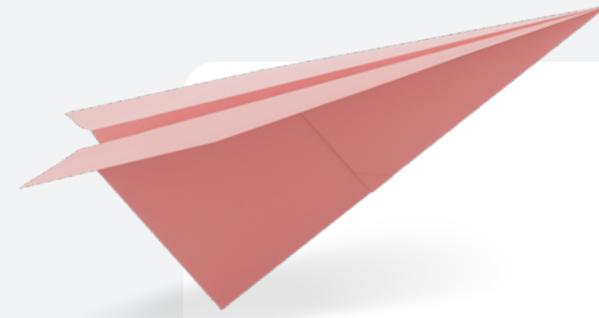
Source: *[BusinessNewsDaily](#)



Business Recommendation

- Memberikan voucher diskon pada pengiriman yang terlambat dapat meningkatkan profit perusahaan minimal sebesar 25%
- Mengatur ulang distribusi barang pada warehouse block sehingga tidak ada penumpukan barang di salah satu block saja



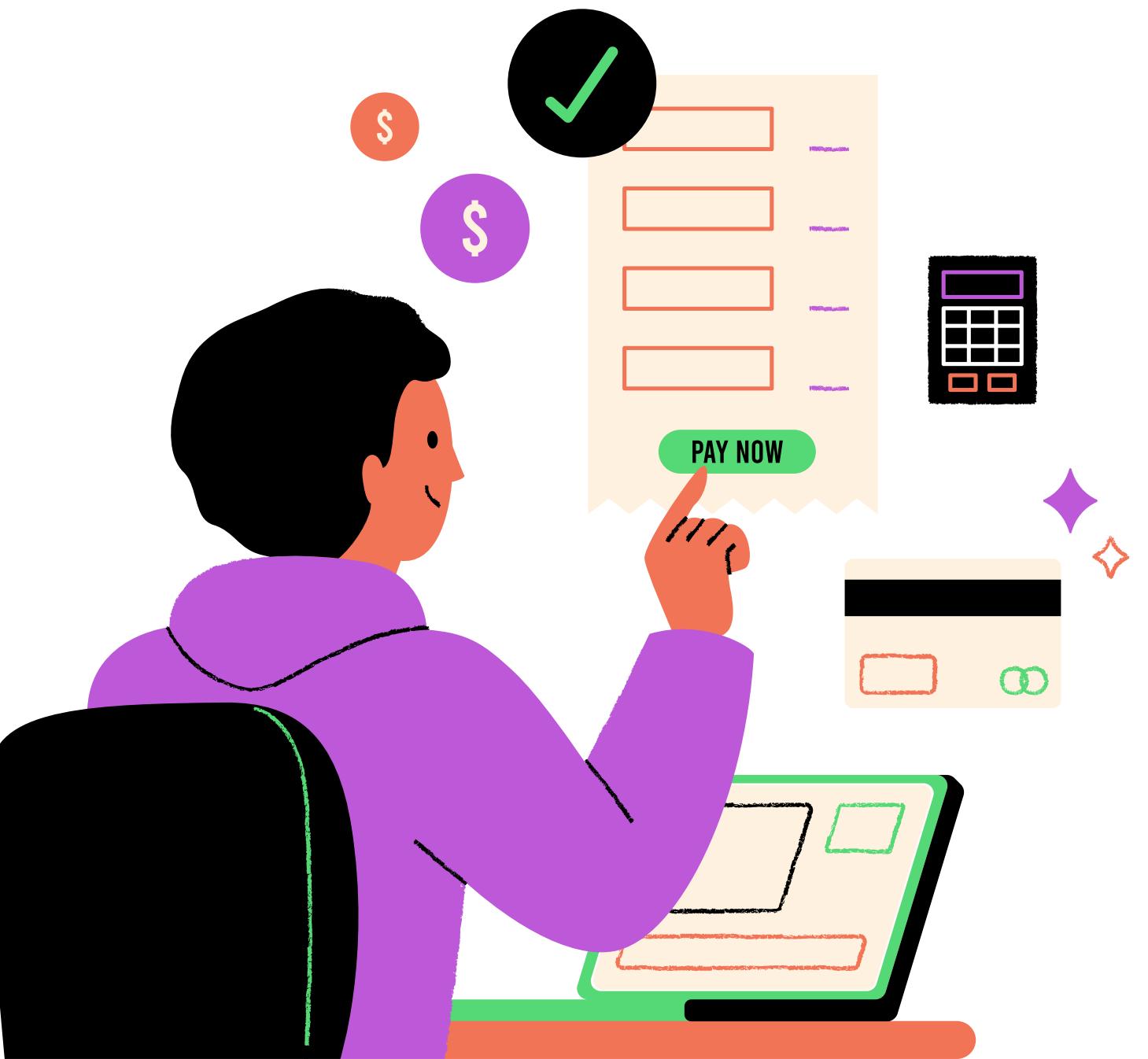


**Thank You!
Ada Pertanyaan ?**

Linkedin : Yudhi Ahmadi



Perhitungan CRR



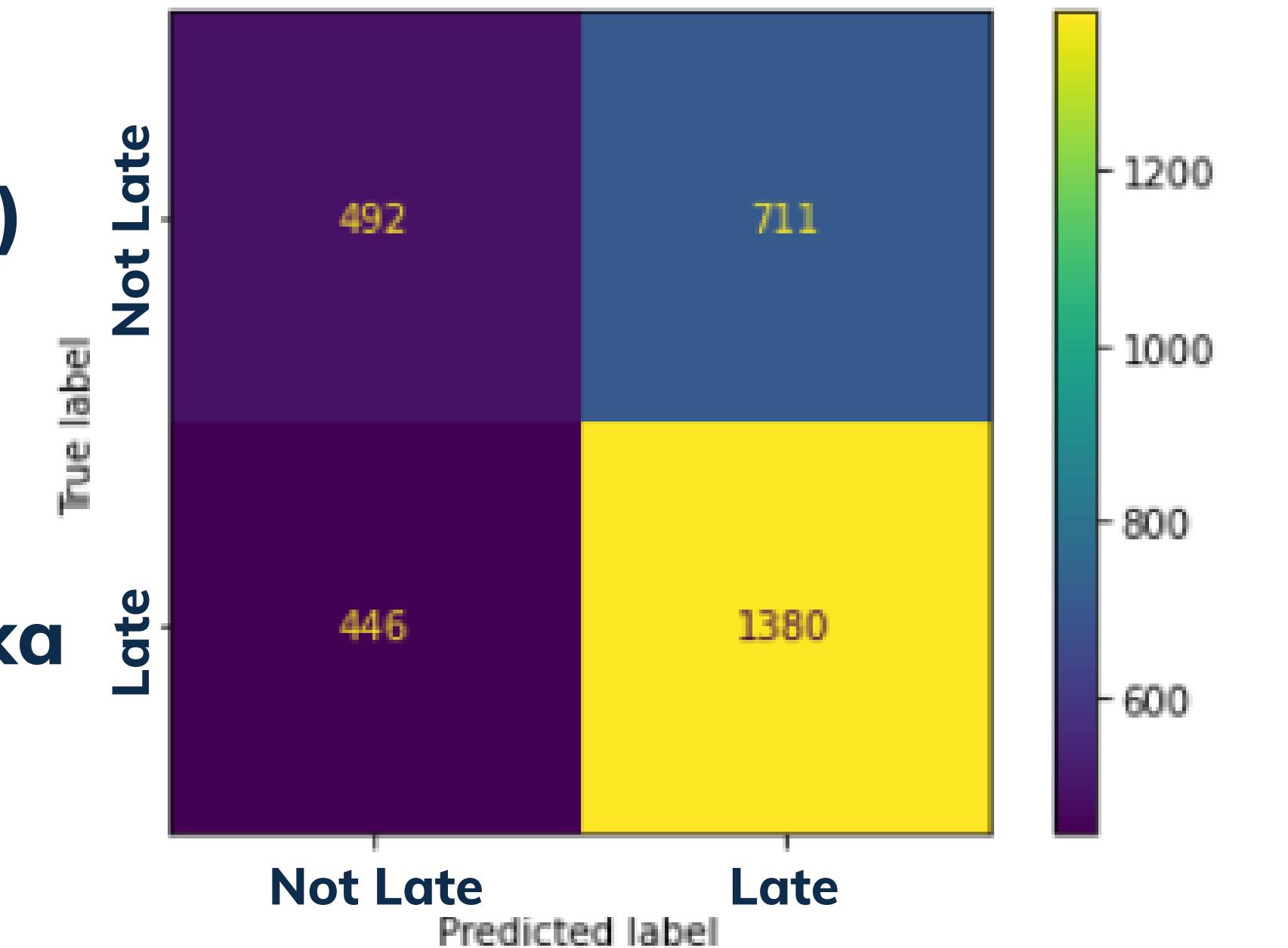
Precision Not Late & Late

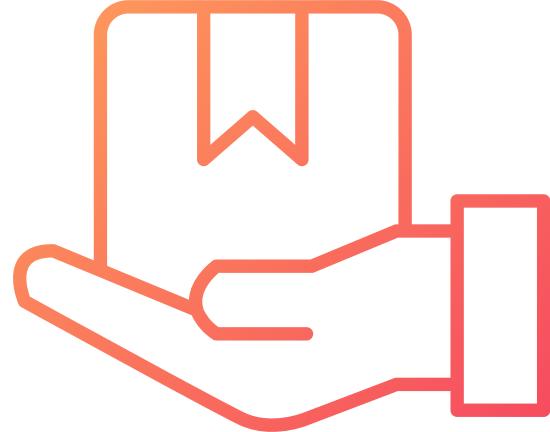
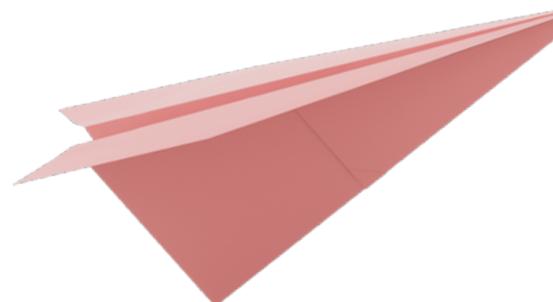
- $TP = 492$ $Precision = TP/(TP+FP)$
- $FN = 446$ $Precision = 0.40$
- $FP = 711$
- $TN = 1380$

Berdasarkan perhitungan, maka precision pengiriman telat/Late :

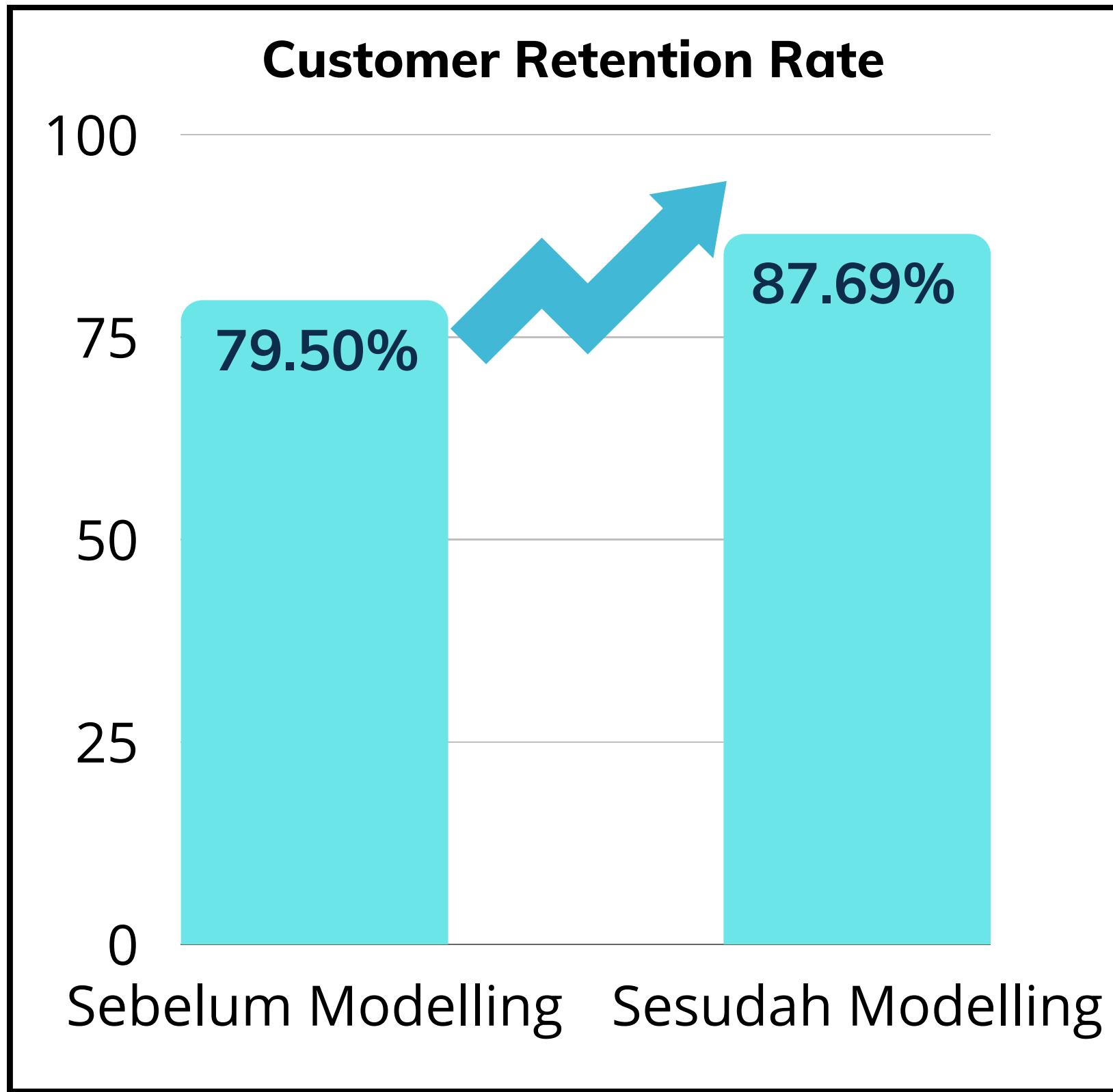
$Late = 1 - 0.40$

$Late = 0.60$





Perhitungan Customer Retention Rate



$$[(CE-CN)/CS] \times 100 = \text{Customer Retention Rate}$$

the number of new customers acquired during the period
↓
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the number of customers at the end of the period
↑
the number of customers at the start of the period
CS - Customer Start

Sebelum Modelling

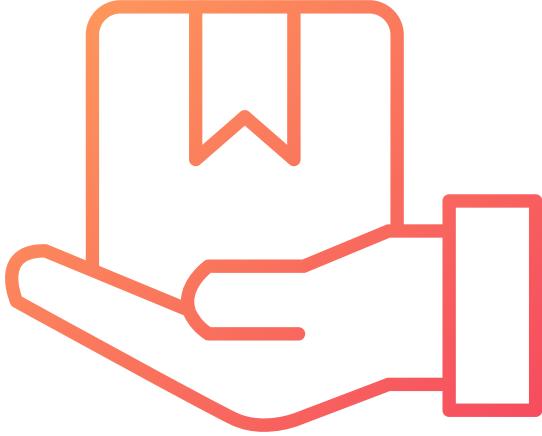
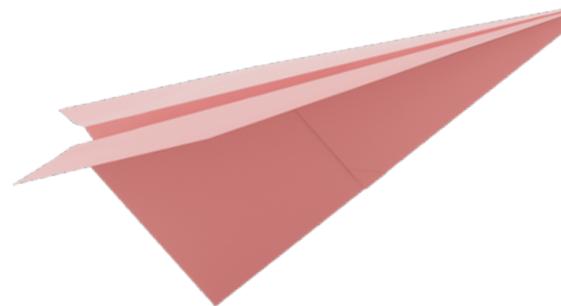
Asumsi 34% pelanggan tidak order lagi*

Setelah Modelling

(Presisi telat 60%) Asumsi pemberian diskon meningkatkan 25% CLV**

Source :

- *SupplyChainBrain
- **cmswire



Perhitungan Customer Retention Rate

$$CRR = \frac{Customer\ Akhir - Customer\ Baru}{Total\ Customer\ Awal} \times 100\%$$

*Asumsi
CLV berbanding lurus dengan Retention Time Period (berapa lama rata-rata pelanggan bertahan dengan bisnis) kita asumsikan sama dengan CRR (tingkat kemampuan bisnis mempertahankan pelanggan)

CLV = Customer Lifetime Value (Dollar) / Total Belanja Customer

Semakin lama retention, semakin meningkat CLV
=

Semakin lama retention, semakin meningkat CRR

Sebelum Modelling, dengan asumsi karena terlambat 34% pelanggan tidak order lagi (churn rate):

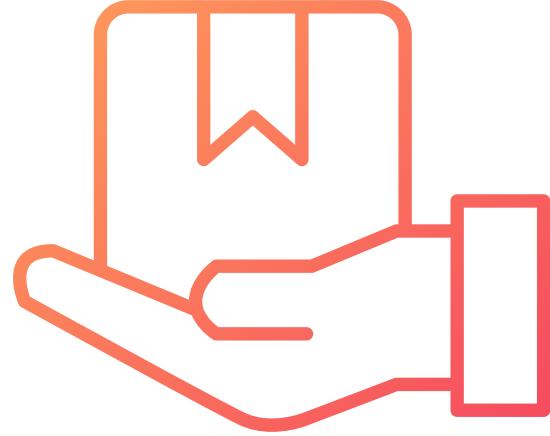
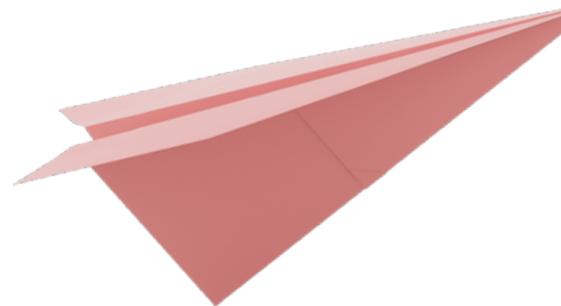
1. $34\% \times 6087 = 2069$ pelanggan tidak order lagi

2. $10096 - 2069 = 8027$ pelanggan tetap order

3. $(8027/10096) \times 100\% = 79.51\%$ CRR awal

Note :

- 34% Churn rate dari supplychainbrain.com
- Jumlah pengiriman telat (raw) = 6087
- Total pengiriman (telat dan tepat waktu) = 10096
- CRR = Customer Retention Rate



Perhitungan Customer Retention Rate

$$LTV = A\$ \times T\# \times R$$

Lifetime Value Average Value of Sale Number of Transactions Retention Time Period

$$CLV = LTV \times M$$

Customer Lifetime Value Lifetime Value Profit Margin

*Asumsi

CLV berbanding lurus dengan Retention Time Period (berapa lama rata-rata pelanggan bertahan dengan bisnis) **kita asumsikan sama dengan CRR** (tingkat kemampuan bisnis mempertahankan pelanggan)

Setelah Modelling (presisi prediksi telat 60%), dengan asumsi karena terlambat 34% pelanggan tidak order lagi (churn rate) & dengan diskon meningkatkan CLV 25%:

1. $1.80\% \times 6087 = 4869$ pelanggan diprediksi telat oleh ML

2. $3.34\% \times 4869 = 1655$ pelanggan tidak order lagi

3. $3.25\% \times 1655 = 413$ pelanggan tidak jadi churn karena ada diskon

4. $10096 - 1655 + 413 = 8854$ pelanggan tetap order

5. $(8854/10096) \times 100\% = 87.69\%$ CRR setelah ML

Note :

CLV 25% dari [BusinessNewsDaily](#).

34% Churn rate dari [supplychainbrain.com](#)