

Customer Lifetime Value Optimization

Identify high-value customer segments

By

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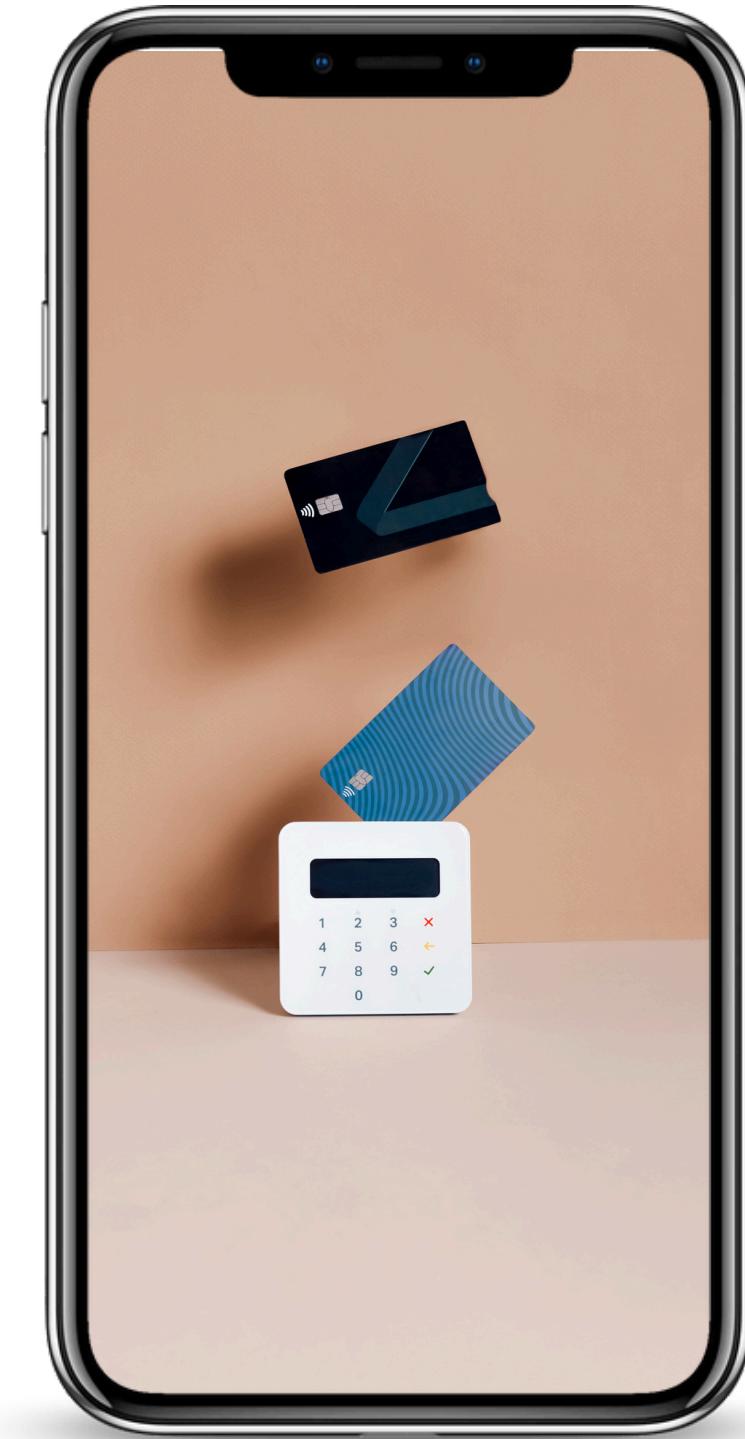
OVERVIEW

1. Business Problem
2. Building Data Pipeline
3. Segmenting and Classifying Customers
4. Estimating Retention Rate
5. Building Visualization Dashboard
6. Next Steps

Business Problem



CARD INDUSTRY



\$36.3 billion

Market size in 2023 in Vietnam

23.8%

Increase in card payments in 2022

452 trillion

Number of card transactions in the first quarter of 2023 in Vietnam

15% CAGR

Expected Compound Annual Growth Rate from 2023 - 2027

BUSINESS CASE

BUSINESS OBJECTIVE

- Enhance marketing effectiveness based on Customer Lifetime Value (CLV) insights

STAKEHOLDERS

- Card issuers' marketing and customer service team(s)

SCOPE

- 1947 customers
- 15,814,609 transactions
- 2010-2020

MVP

Output

- Data Pipeline
- Clustering Model
- Classification Model
- Visualization Dashboard

Service

- Amazon Web Services

CLV METRICS

RFM Model

- **Recency:** The time since the customer's last transaction
 - **Frequency:** Total number of transactions over a given period
 - **Monetary:** Average Amount per purchase
- => To generate customer segments

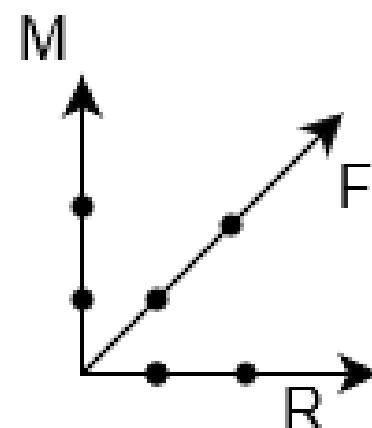
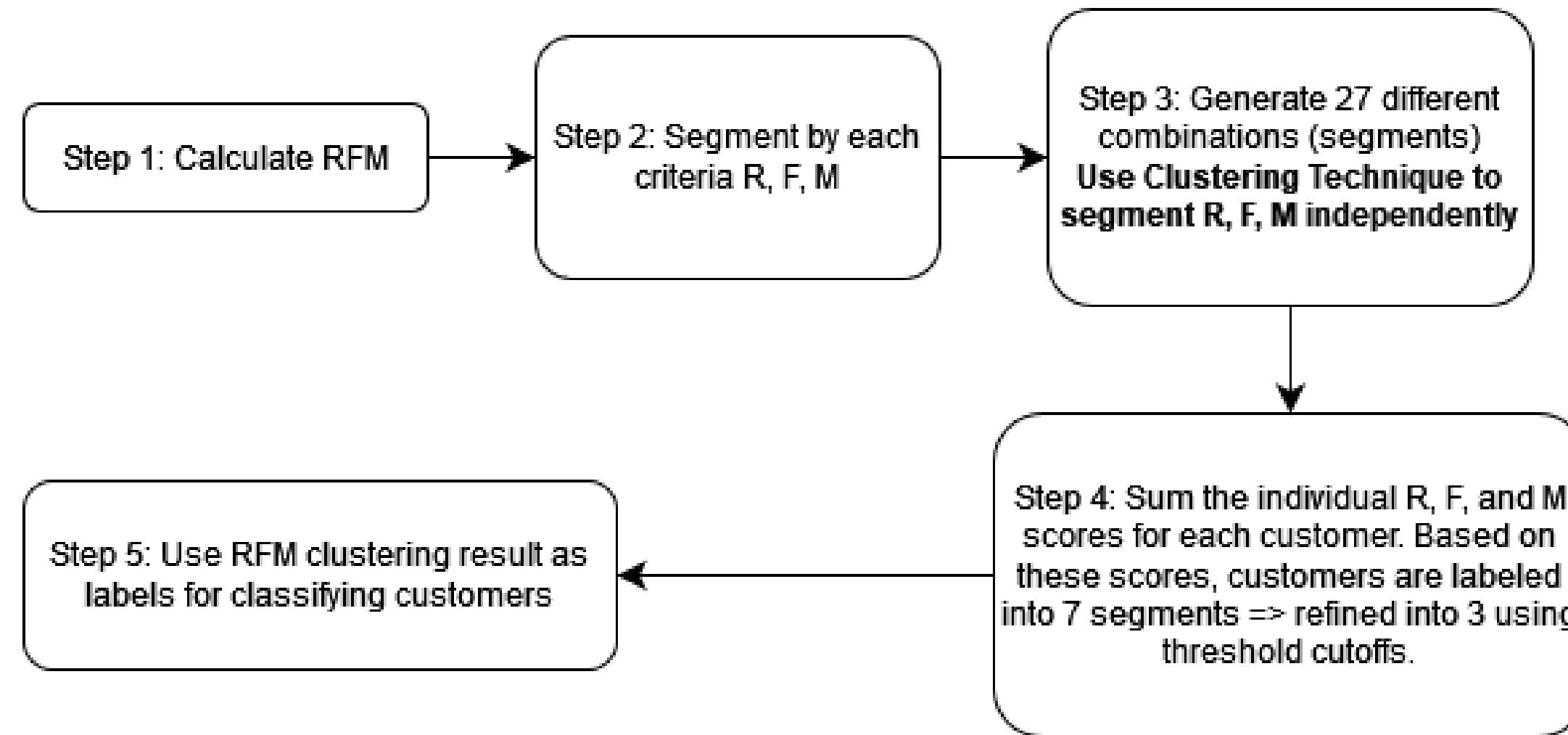
IMPACT

- Precision Targeting for new & existing customers
- Simplicity
- Cost Transparency

ASSUMPTIONS

- Data is reliable
- Typical bank marketing spend per segment is equal

RFM MODEL FLOW



CustomerID	R	F	M	Score	Segment
ID1	2	2	2	6	High Value
ID2	0	2	2	4	Middle Value
ID3	0	0	2	2	Low Value
...

Building Data Pipeline



INFORMATION TYPES

Transaction Data

Details of card transactions, such as amount, type, and merchant information

Card Data

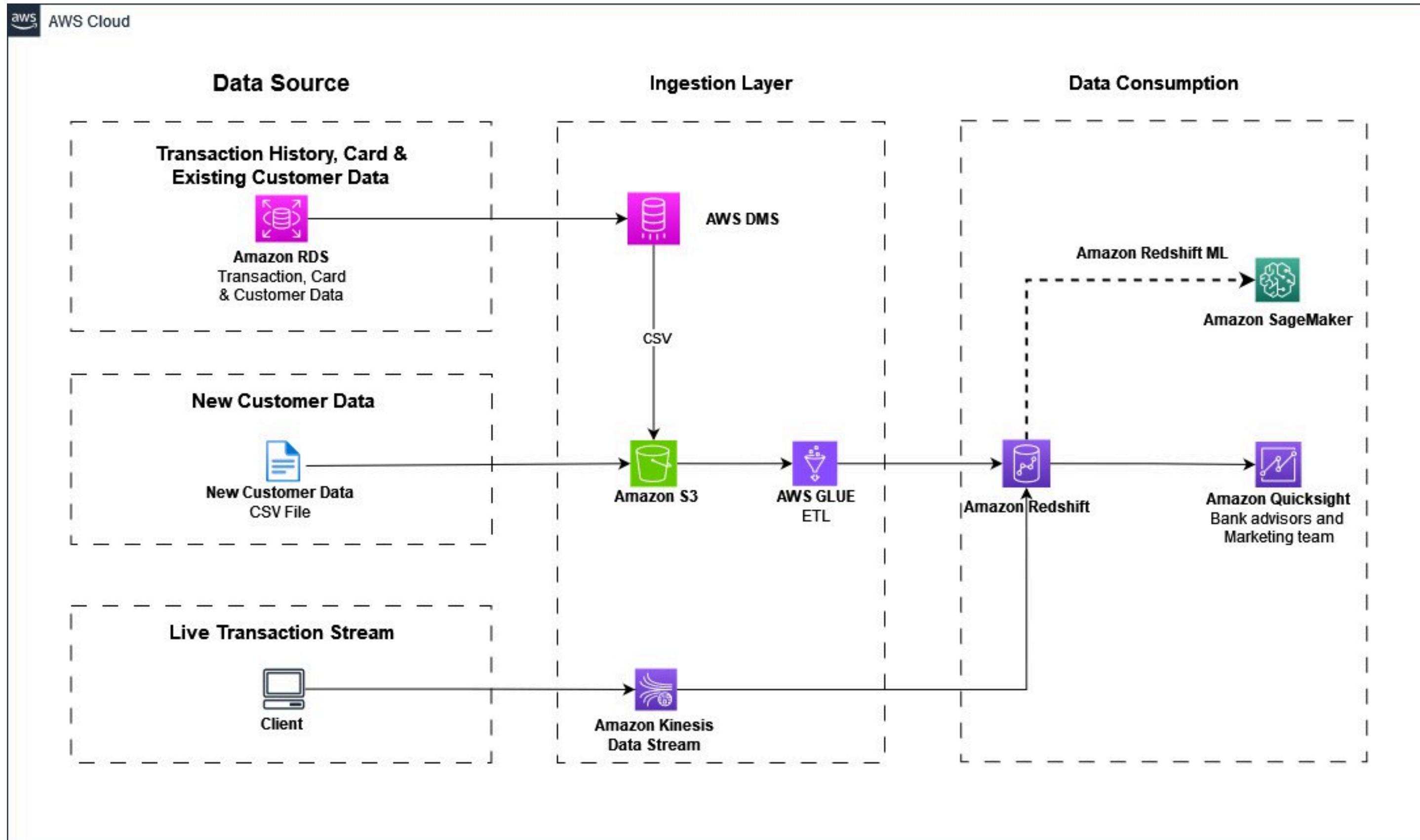
Information about card types, numbers, expiration dates, and security details.

User Profiles

Personal and financial information of cardholders, including name, age, income, and debt levels.



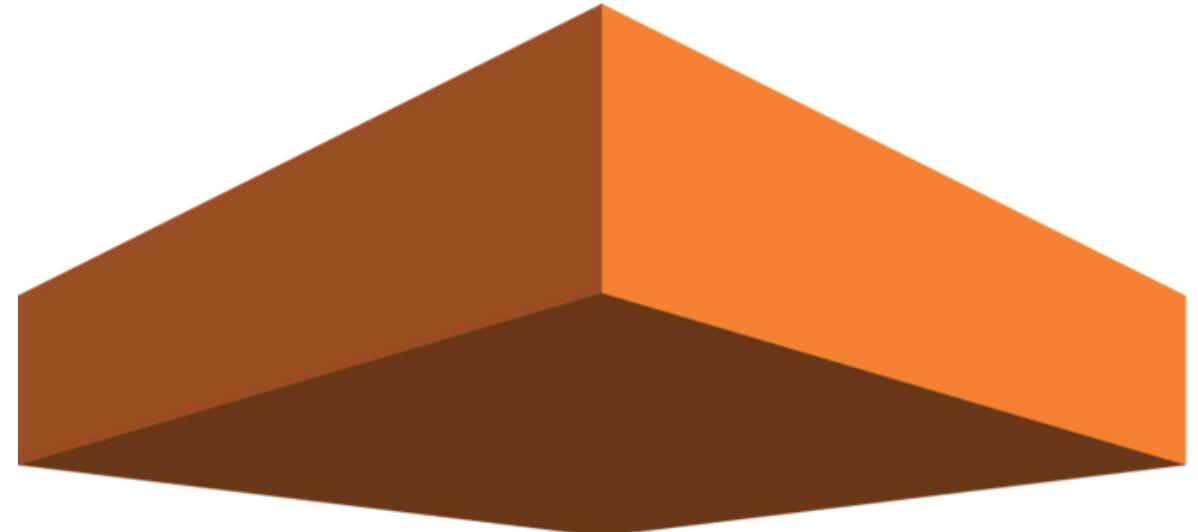
DATA PIPELINE ON AWS



IMPACT OF SOLUTION

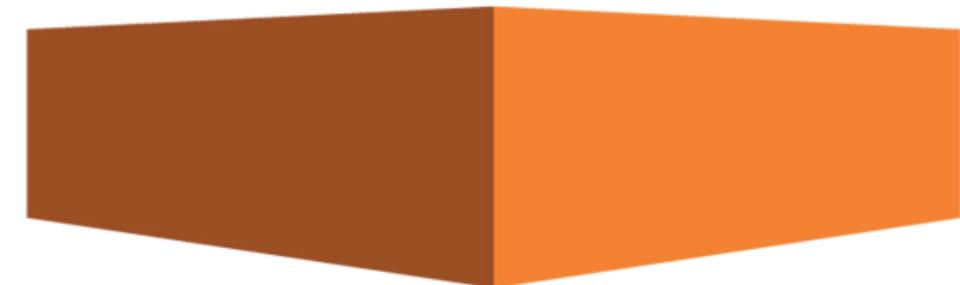
Simple

Minimizes dependence on multiple service providers and unnecessary technological features



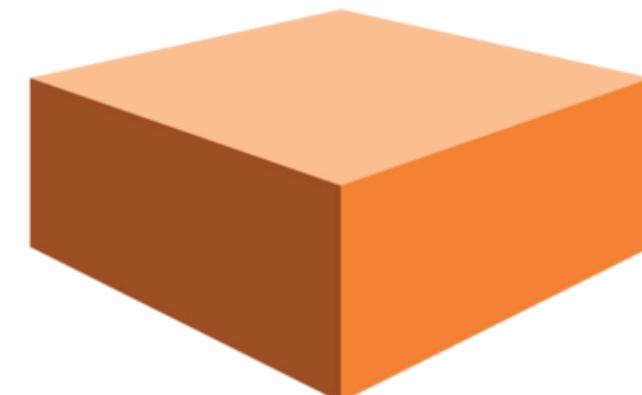
Scalable

Prepare for increased storage, analysis, and visualization needs as the business grows.



Cost-saving

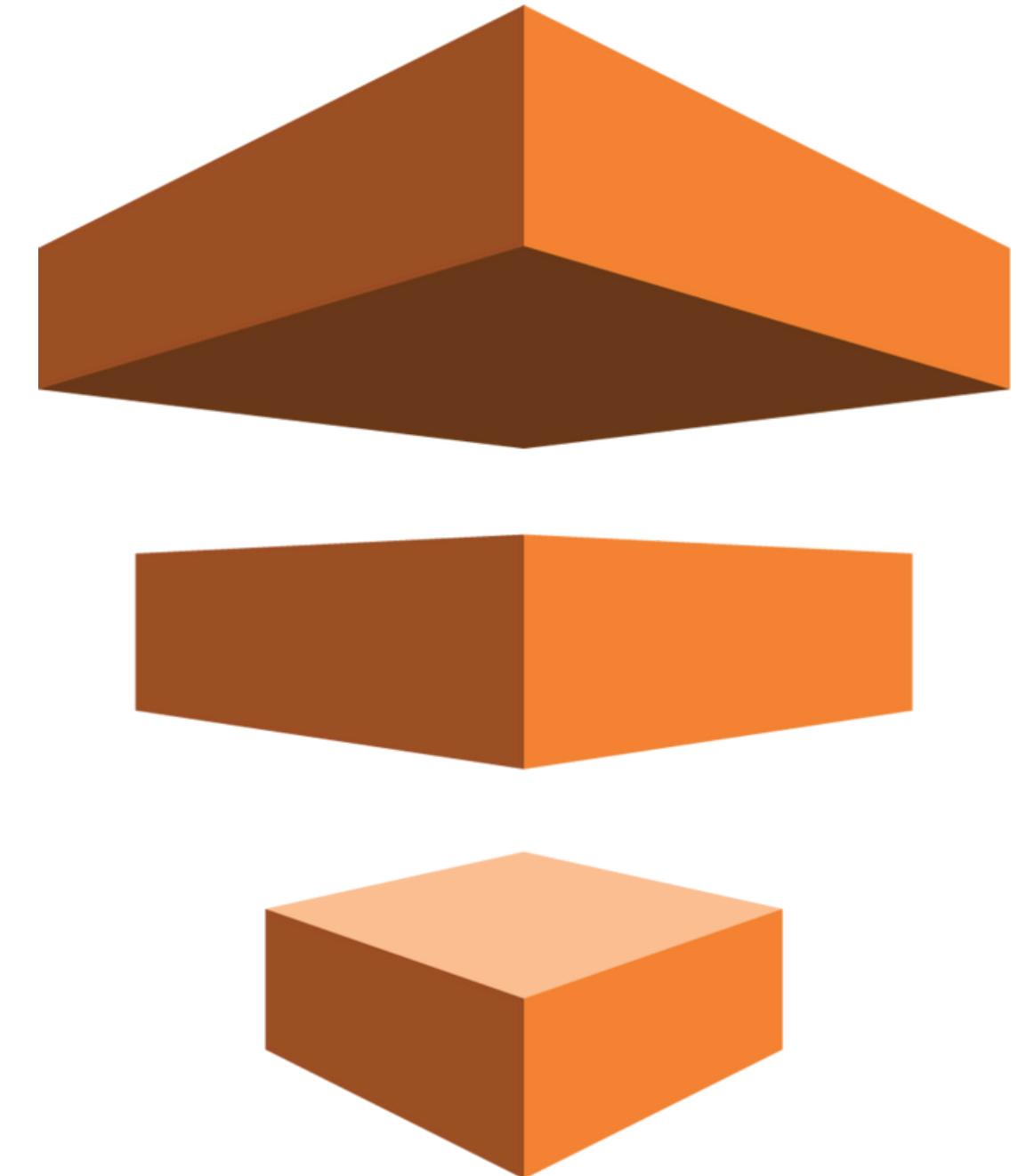
Minimize operational and maintenance costs.



COST EFFECTIVENESS

Using AWS Pricing Calculator

AWS Service	Estimated Cost (USD)			
AWS RDS For MySQL	MySQL instance	RDS Proxy	Storage	
	423	27	352	802
Amazon DMS	On-Demand instances		Storage	
	422		322	744
Amazon S3	S3 Standard feature			
	398			398
AWS Glue	ETL Jobs	Crawlers		
	538	75		613
Amazon Kinesis Data Streams				860
Amazon Redshift				551
Amazon SageMaker				323
Amazon QuickSight				120
Total				4,411



Segmenting & Classifying Customers



CUSTOMER SEGMENTATION & CLASSIFICATION FLOW

Step 1: RFM Segmentation

- **Objective:** Segment customers based on Recency (R), Frequency (F), and Monetary (M) values.
- **Methodology:** Utilize K-means clustering independently on R, F, and M to categorize customers.
- *Each metric is assigned a score and ordered from worst to best, resulting in 27 different combinations*

Step 2: RFM Scoring

- **Calculation:** Sum the individual R, F, and M scores for each customer.
- **Outcome:** Higher total scores indicate higher value customers.
- *Based on these scores, customers are labeled into distinct segments, initially creating 7 segments, which are then refined into 3 using threshold cutoffs.*

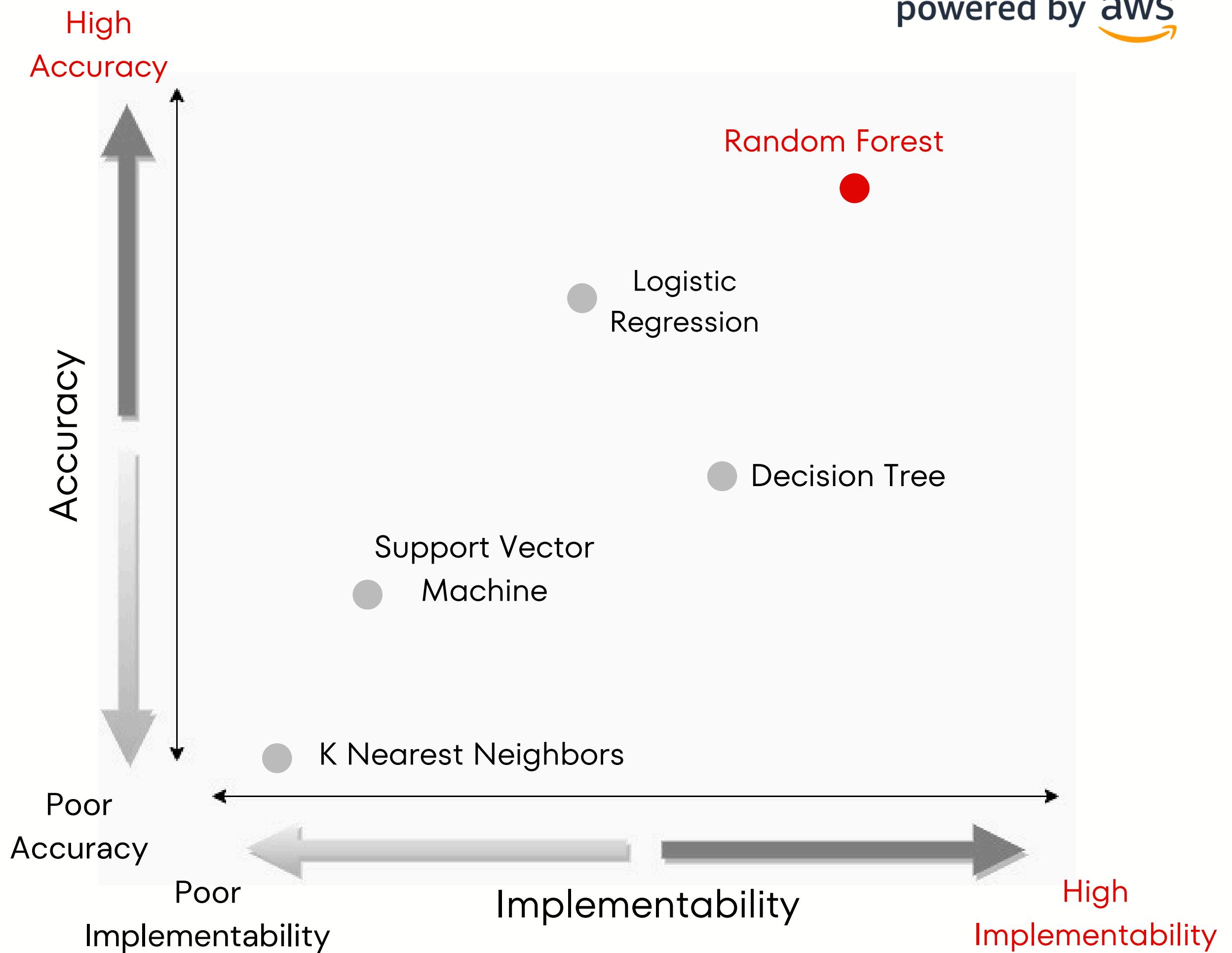
Step 3: Customer Classification

- **Objective:** Classify new customers into existing segments. (output of s2: label of s3)
- **Method:** Use demographic information (e.g., age, income) to predict the segment of new customers
- *Purpose: new customers are integrated into appropriate segment for targeted marketing and service*

SEGMENTATION MODEL SELECTION



CLASSIFICATION MODEL SELECTION



Estimating Retention Rate



ESTIMATING RETENTION RATE FLOW

Step 1: Data Labeling & Model Training

Label customers based on one year of transaction history:

- Stay: For those who remain over k year(s).
- Leave: For those who exit within k year(s).

Train a logistic regression model using these labels and demographic data to predict retention.

Step 2: Retention rate prediction

Use the model built in step 1 to estimate the retention rate of new customer in the k year(s)



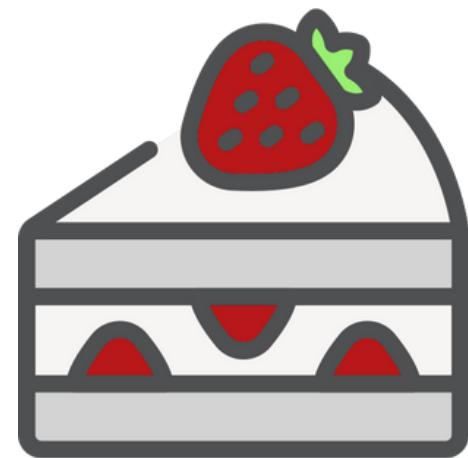
Step 3: CLV Calculation

$$CLV(k) = \text{Revenue} \times k \text{ (years)} \times \text{Retention Rate}$$

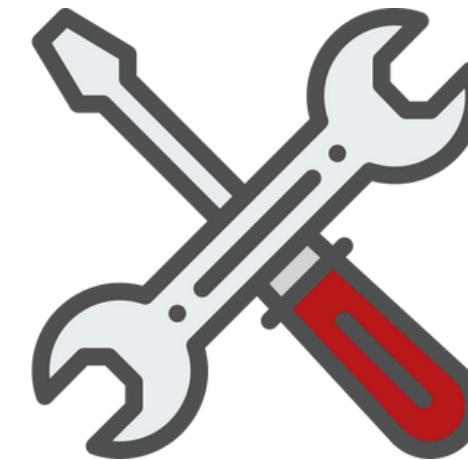
Building Visualization Dashboard



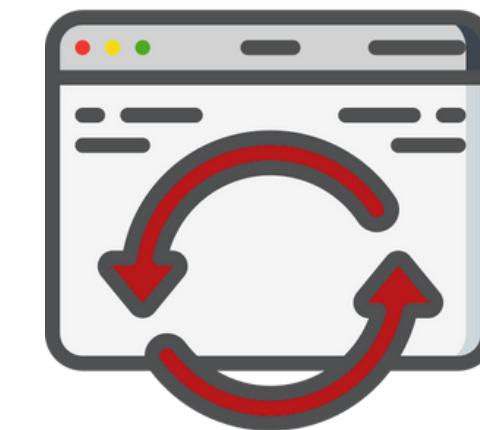
GETTING INSIGHTS WITH VISUALIZATION DASHBOARD



User Friendly



Simple setup & Maintain



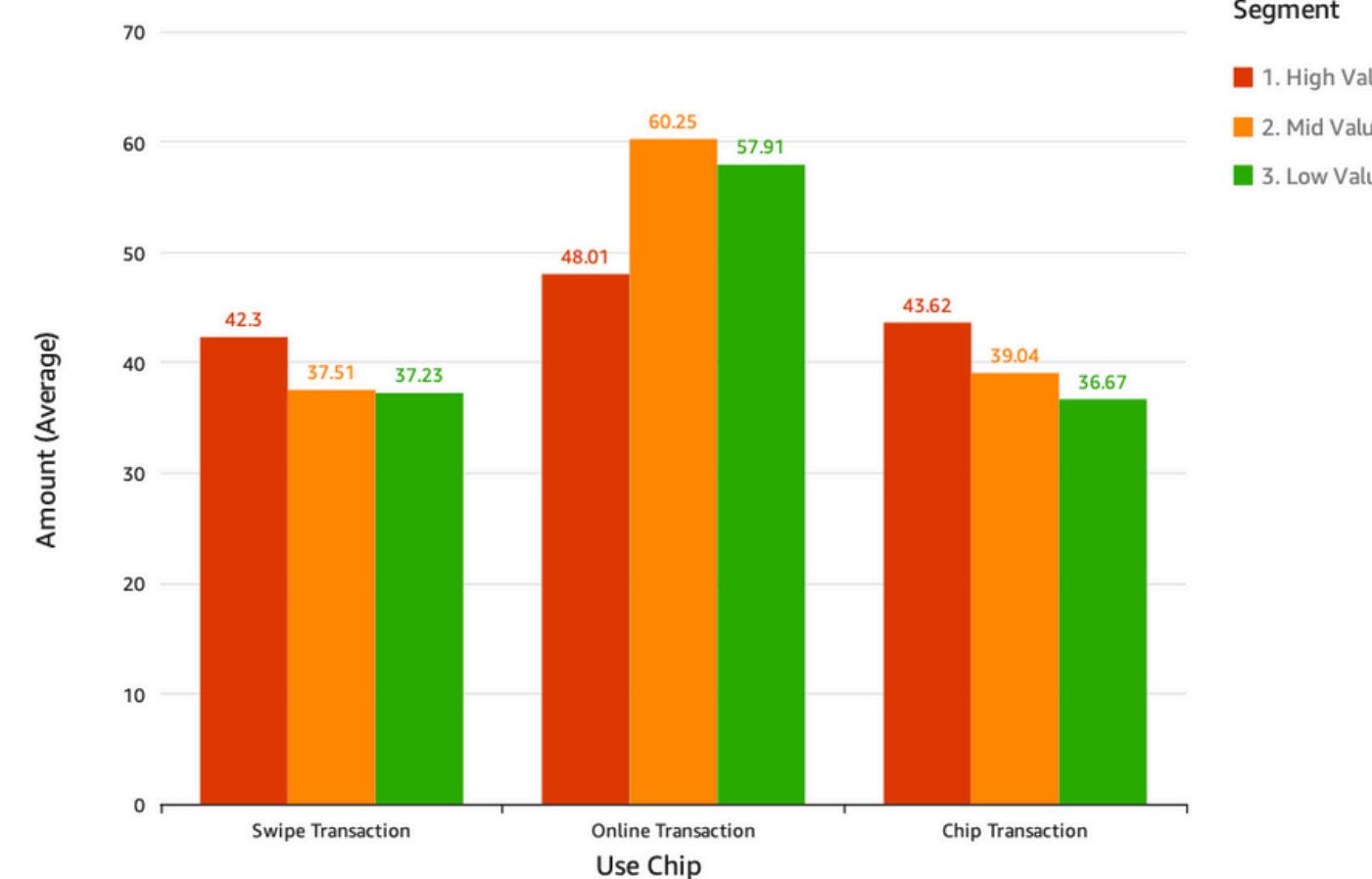
Easy to Update

DASHBOARD SAMPLE

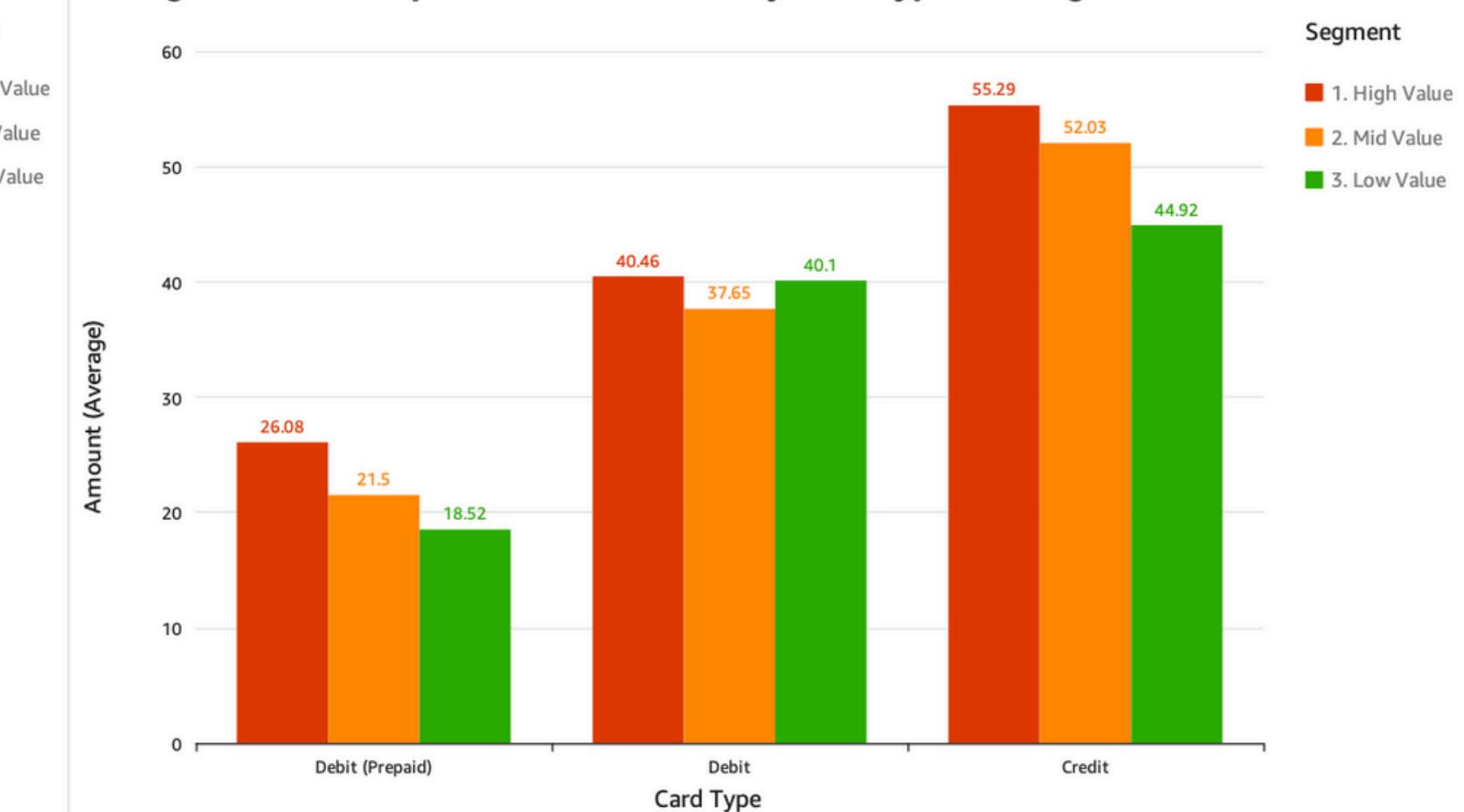
Customer Demographic Information by Segment

Segment	User	Current Age	Yearly Income - Person	Total Debt	FICO Score	Num Credit Cards
1. High Value	245	52	49,117	57,746	713	4
2. Mid Value	886	50	38,983	51,704	712.5	3
3. Low Value	548	25	41,509	65,805.5	710	2

Average of Amount Spent Per Transaction by Use Chip and Segment



Average of Amount Spent Per Transaction by Card Type and Segment



Suggestions & Next Steps



RECOMMENDATIONS

High-value Segment

Focus on enhancing premium card offerings that provide superior rewards and benefits, emphasizing security and exclusivity to align with their high spending habits and need for convenience.

Mid-value Segment

Offer products that enhance their digital engagement and provide value for money, such as credit cards with moderate rewards & security features that support their mixed use of debit and credit.

Low-value Segment

Given their high online spending but overall lower transaction frequency, products like prepaid or secured credit cards could be ideal, providing them with budget control while still allowing for the occasional significant purchase.

NEXT STEPS

- **Improve classification model's result.** Explore different models and new data sources, such as historical data from CIC credit bureaus, to enhance prediction accuracy.
- **Predict retention rate.** Based on model's result, develop a policy to maintain customer engagement.
- **Investigate alternative S3 storage options and tailor policy** update data based on the frequency of data updates, aiming for flexible service use and reduced storage costs.
- **Collaborate with the marketing team** to better understand customer needs and design effective real-life campaigns.