DATA ANALYTICS PORTFOLIO

Take Home Test

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Introduction

Hi! I am Rara. A highly motivated Industrial Engineering graduate from Sebelas Maret University with 1 year of professional experience in port services and healthcare services. **Strongly interested in Data Science and Data Analytics**, with foundational skills in data processing, statistical analysis, and data visualization to support effective decision-making. Proficient in **Python, SQL**, and **Excel**, with experience using tools such as Pandas, Numpy, Matplotlib, and Looker Studio. Known for being **analytical, detail-oriented, and a fast learner**, with the ability to work both independently and in teams. Eager to contribute to data-driven projects and continuous improvement initiatives.

Working Experience

○ PT Revolusi Kesehatan Indonesia

Operation Team

Nov, 2024 - Present

○ PT Krakatau Bandar Samudera

Port Area and Warehouse Intern

Jan, 2023 - Feb, 2023

Educational Background

○ Dibimbing.id

Data Analyst & Data Science
Bootcamp (Non-Degree)

May, 2025 - Present

○ Universitas Sebelas Maret

Industrial Engineering
(Bachelor of Engineering)

Aug, 2020 - July, 2024

PREVIOUS PROJECT

there are some projects that have been build to make a data analytics portofolio

Customer Satisfaction & Sentiment Analysis Report

People Analytics : Job Satisfaction Report

A/B Testing Marketing Design

Marketing Analytics

MAIN PROJECT

**Funnel Conversion and RFM Customer Segmentation
Analysis for E-Commerce Optimization**

MAIN PROJECT CONTENTS

This project explores customer behavior through a comprehensive funnel analysis to identify drop-off points across the user journey, combined with RFM-based customer segmentation to understand value distribution and purchasing patterns.
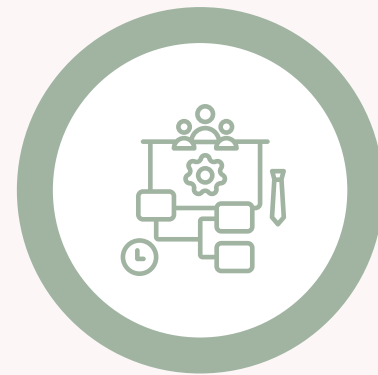
STEP 1

Bussiness Understanding

Including Project Background, Problem Statement, and Objectives

STEP 2

Data Understanding

Undertsand all about dataset

STEP 3

Data Preprocessing

Cleaning dataset to make a better exploration

STEP 4

Funnel Analysis

Analysis funnel conversion to Identify where users are most likely to drop off

STEP 5

RFM Analysis

Understand which customers provide the highest value to the business

STEP 6

Some Recommendations

Design effective marketing strategies to improve both conversion and retention rates.

BUSINESS PROBLEM

The e-commerce company has a diverse user base with varying behaviors across different stages of the shopping journey — from browsing products to completing purchases. However, not all users successfully reach the purchase stage, and not all buyers contribute equally to total revenue.

Without a deep understanding of user behavior and customer segmentation, the company struggles to:

* Identify where users are most likely to drop off during the conversion funnel,

* Understand which customers provide the highest value to the business, and

* Design effective marketing strategies to improve both conversion and retention rates.

OBJECTIVES

The objective is to gain deeper insights into customer behavior by evaluating the user funnel and segmenting customers to support more data-driven decision-making.
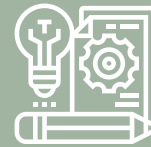
Analyze user behavior

Analyze user behavior at each stage of the purchase funnel

Identify Key Drop Off

Identify the key drop-off points within the funnel to improve conversion rates.

Measure customer value

Measure customer value based on Recency, Frequency, and Monetary (RFM) metrics.

Segmenting customers

Segment customers into groups to enable more targeted and effective marketing strategies.

Provide strategic insights

Provide strategic insights to enhance both conversion efficiency and customer retention.
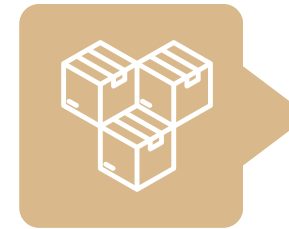
DATA UNDERSTANDING

This section outlines the dataset used in the project, describing its key features and how it reflects user behavior and purchasing patterns essential for funnel and segmentation analysis.

Source Dataset **01**
Kaggle - Customer sessions and actions for propensity model

Total Data **02**
2090 rows and 9 columns

Data Informations **03**
detailed information about customer interactions on an e-commerce platform

User Actions **04**
searching, product viewing, and adding items to the cart

BUSINESS QUESTION

Here are some exploratory questions to carry out the project objectives

Funnel

How many users are present at each stage of the funnel?

RFM

How are customers segmented based on their RFM scores?

Funnel

What are the conversion rates between each stage, and where does the largest drop-off occur?
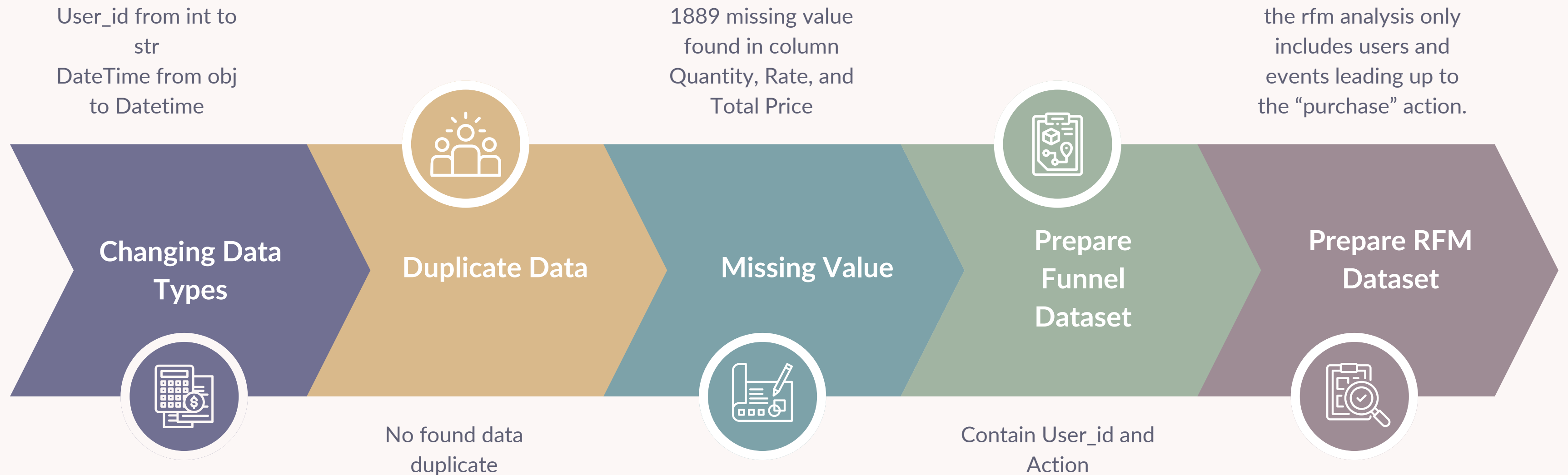
RFM

Which customer segments contribute the most to total sales?

DATA PREPROCESSING

the initial step in develop model aimed at cleaning and preparing the dataset for further exploration.

User_id from int to str
DateTime from obj to Datetime

1889 missing value found in column Quantity, Rate, and Total Price

the rfm analysis only includes users and events leading up to the "purchase" action.

Changing Data Types

Duplicate Data

Missing Value

Prepare Funnel Dataset

Prepare RFM Dataset

No found data duplicate

Contain User_id and Action

Notes: The Quantity, Rate, and Total Price columns contain many NaN values in the customer behavior dataset because only certain types of actions (e.g., purchase) have values in the Quantity, Rate, and Total Price columns.

DATA PREPROCESSING

the initial step in develop model aimed at cleaning and preparing the dataset for further exploration.

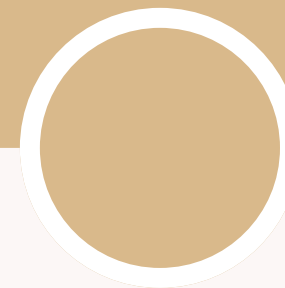Handing outlier in rfm dataset using winsorizing (5%–95%)

RESULT

Outlier Handling

Funnel Dataset : 2090 rows and 2 columns

RFM Dataset : 201 rows and 7 columns

Notes: Outlier checks are only performed on the rfm dataset because there is no numerical data in the funnel dataset, #so there is no need to perform outlier checks.
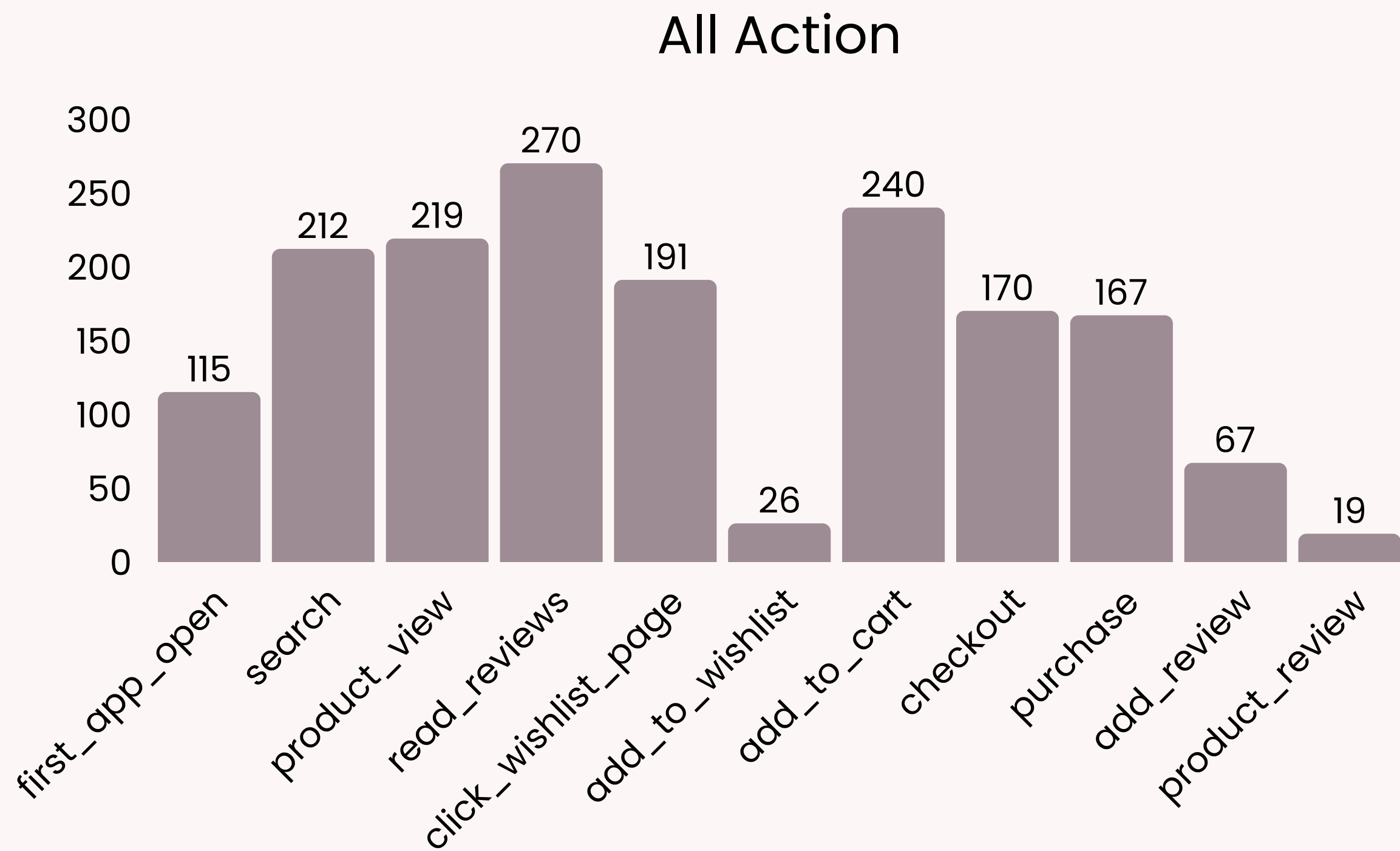
FUNNEL ANALYSIS

To identify where users are most likely to drop off during the conversion funnel

ACTION DISTRIBUTION

This chart shows all the actions taken by customers in the dataset.

All Action

- This chart shows about how often each activity occurs in the app. However, not all actions in this chart will be used to build the conversion funnel. because it doesn't represent the actual conversion flow — it only shows an activity distribution.
- To capture true conversion behavior, the funnel will be constructed using the core steps only: first_app_open → product_view → add_to_cart → checkout → purchase.
- Other user actions will still be analyzed separately as supporting insights to understand additional behavior patterns.

FUNNEL CONVERSION

Where user are most likely to drop off?

1. User Behavior at Each Stage

- 115 users opened the app → 77 viewed products (67%).
- Of those who viewed products, only 37 added to cart (32%).
- 23 proceeded to checkout (62% of add to cart).
- All users who entered checkout ultimately completed a purchase (100%).

2. Key Drop-off Points
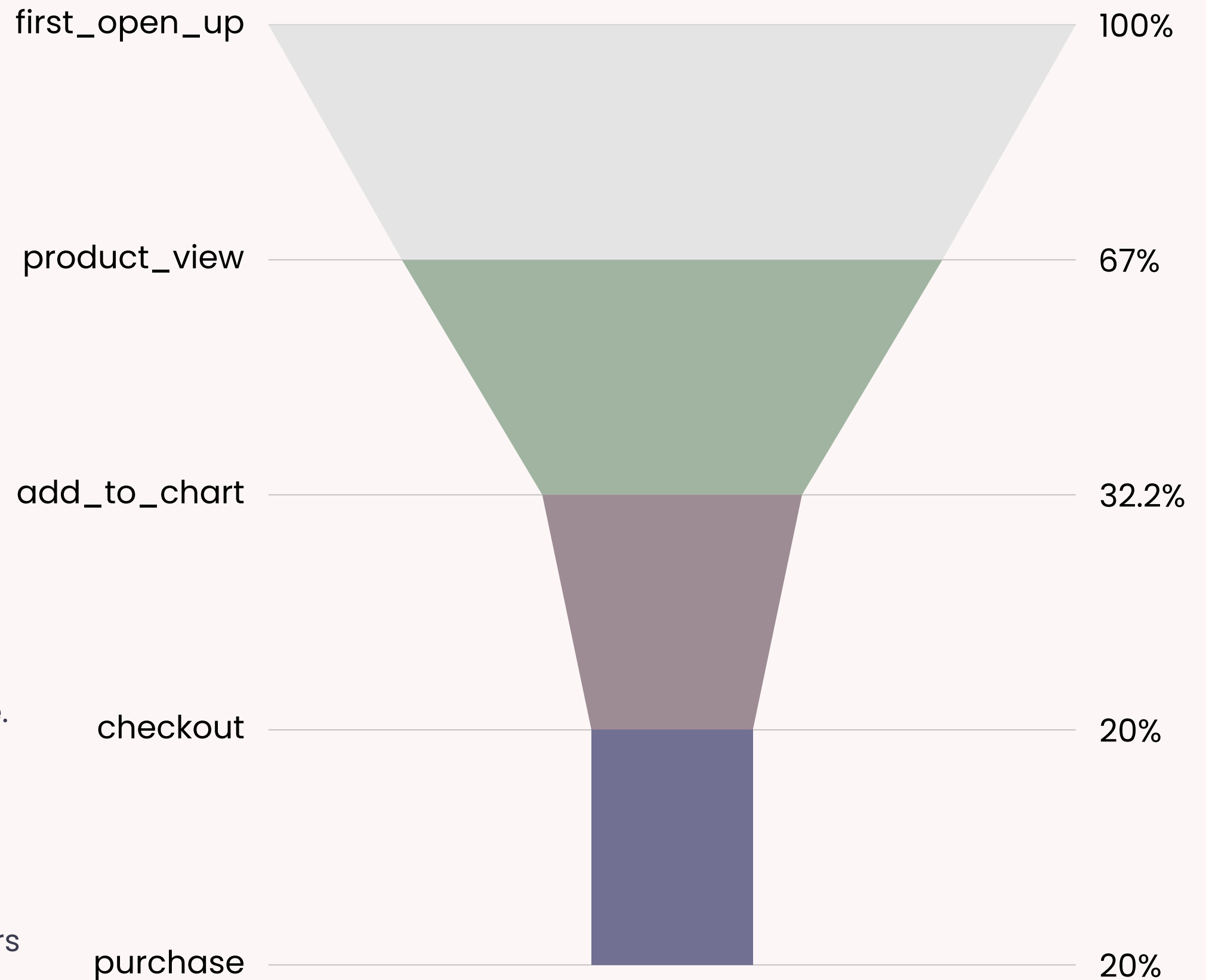
- Product View → Add to Cart (32%)

The biggest drop-off — likely because the product is unattractive or the price/shipping costs are not suitable.
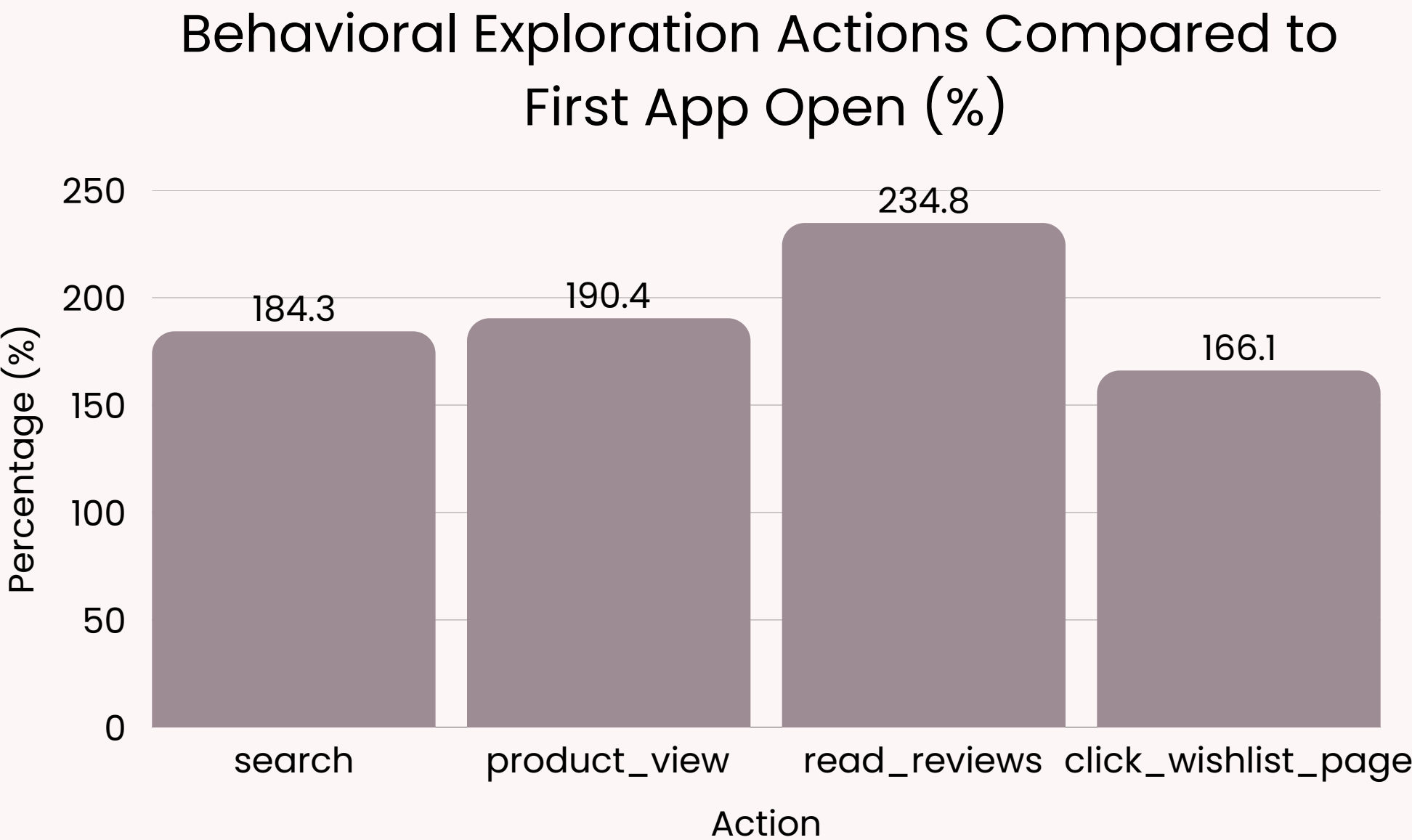
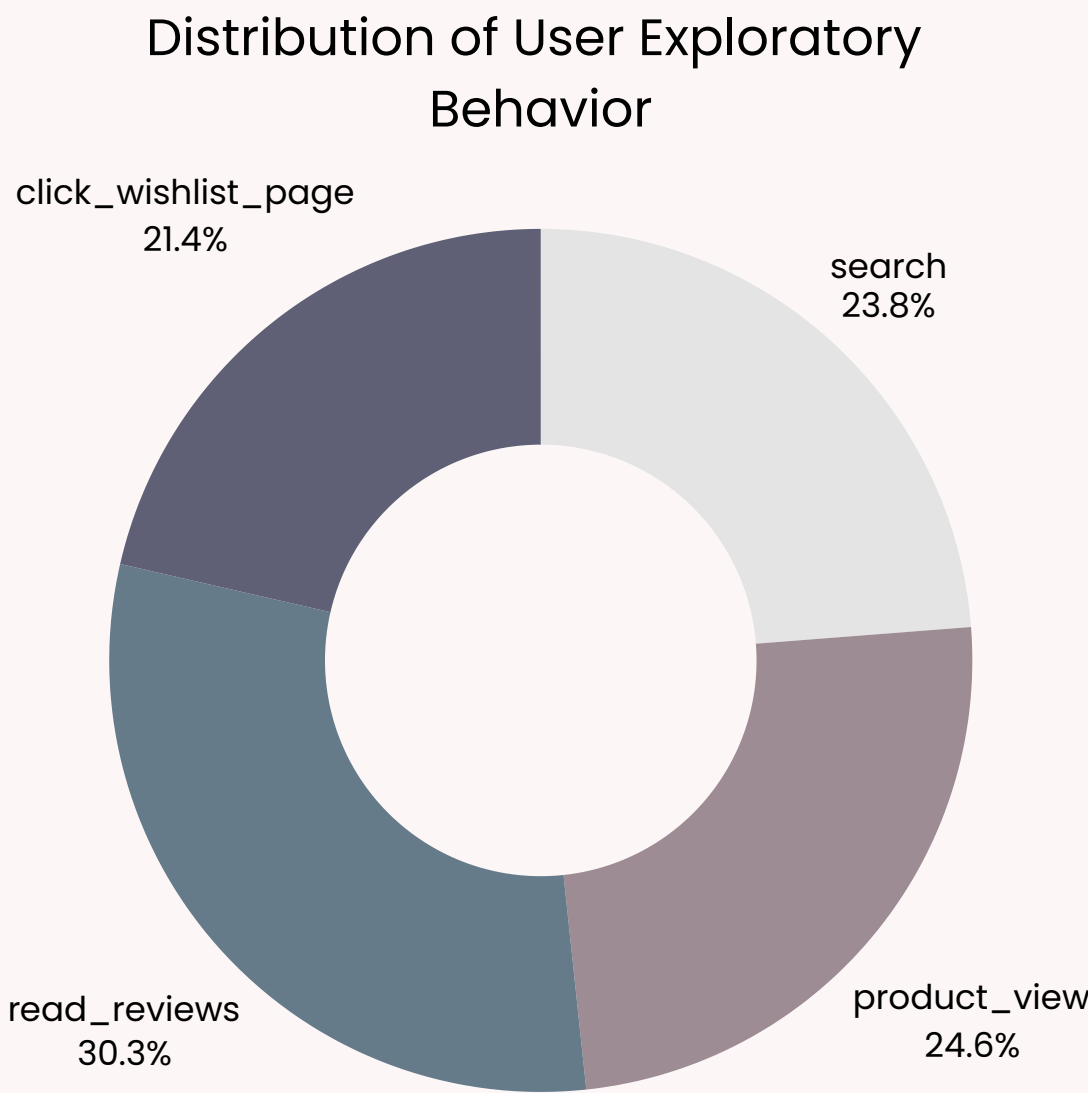- Add to Cart → Checkout

Many users cancel — possibly because shipping costs appear at the end or the cart is only used for saving items.

- Checkout → Purchase (100%)

The payment stage is very effective, with almost no users abandoning at this stage.
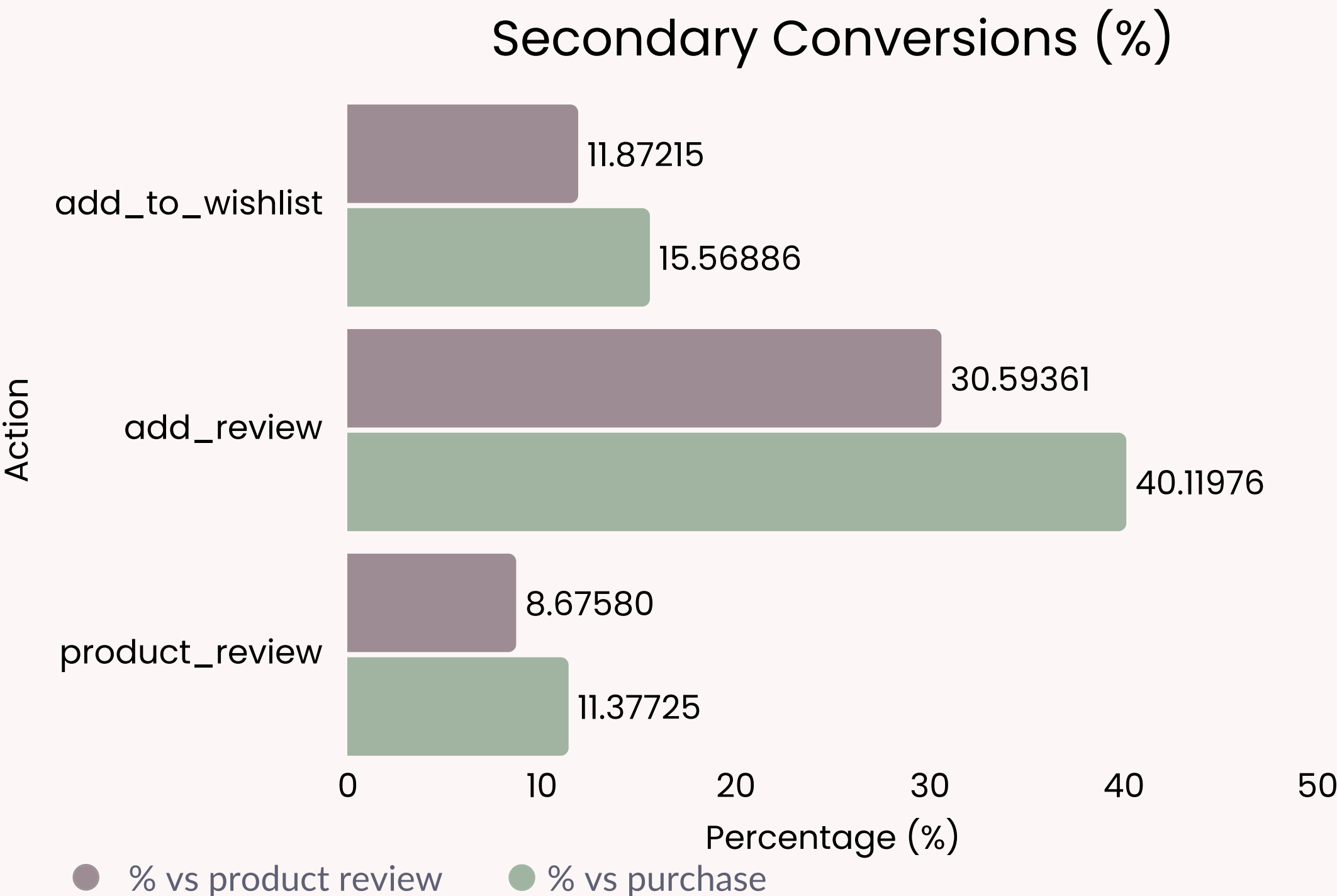
Stage	Percentage
first_open_up	100%
product_view	67%
add_to_chart	32.2%
checkout	20%
purchase	20%

BEHAVIORAL ANALYSIS

Distribution of User Exploratory Behavior

click_wishlist_page
21.4%

search
23.8%

read_reviews
30.3%

product_view
24.6%

Behavioral Exploration Actions Compared to First App Open (%)

184.3 — search
190.4 — product_view
234.8 — read_reviews
166.1 — click_wishlist_page

Percentage (%)

Action

1. Read Reviews (highest ratio at 235%), highlighting that users heavily rely on reviews before making a decision.
2. Product viewing (190%) and search activity (184%) are high. This suggests that many users enter the app through deep links, notifications, ads, or external pages rather than through the standard app entry point.
3. Wishlist interactions remain significant (166%).This reflects strong user consideration behavior prior to purchasing.

SECONDARY CONVERSION INSIGHTS

Actions that are not directly related to transactions, but add long-term value. To help measure customer loyalty, user-generated content, and remarketing opportunities.

Secondary Conversions (%)

- User-generated content is very powerful. Add Review has the highest conversion rate (30–40%), indicating that many active users contribute after purchase.

- Wishlist is low but significant. Add to Wishlist is only 12–15%, but it remains important as an early interest signal for remarketing.

- Product Review is the lowest. Only 9–11%, indicating few users write detailed reviews — an opportunity to encourage quality content through incentives.

add_to_wishlist
- 11.87215
- 15.56886

add_review
- 30.59361
- 40.11976

product_review
- 8.67580
- 11.37725

Action

Percentage (%)

● % vs product review   ● % vs purchase

RFM
ANALYSIS

To understand which customers provide the highest value to the business
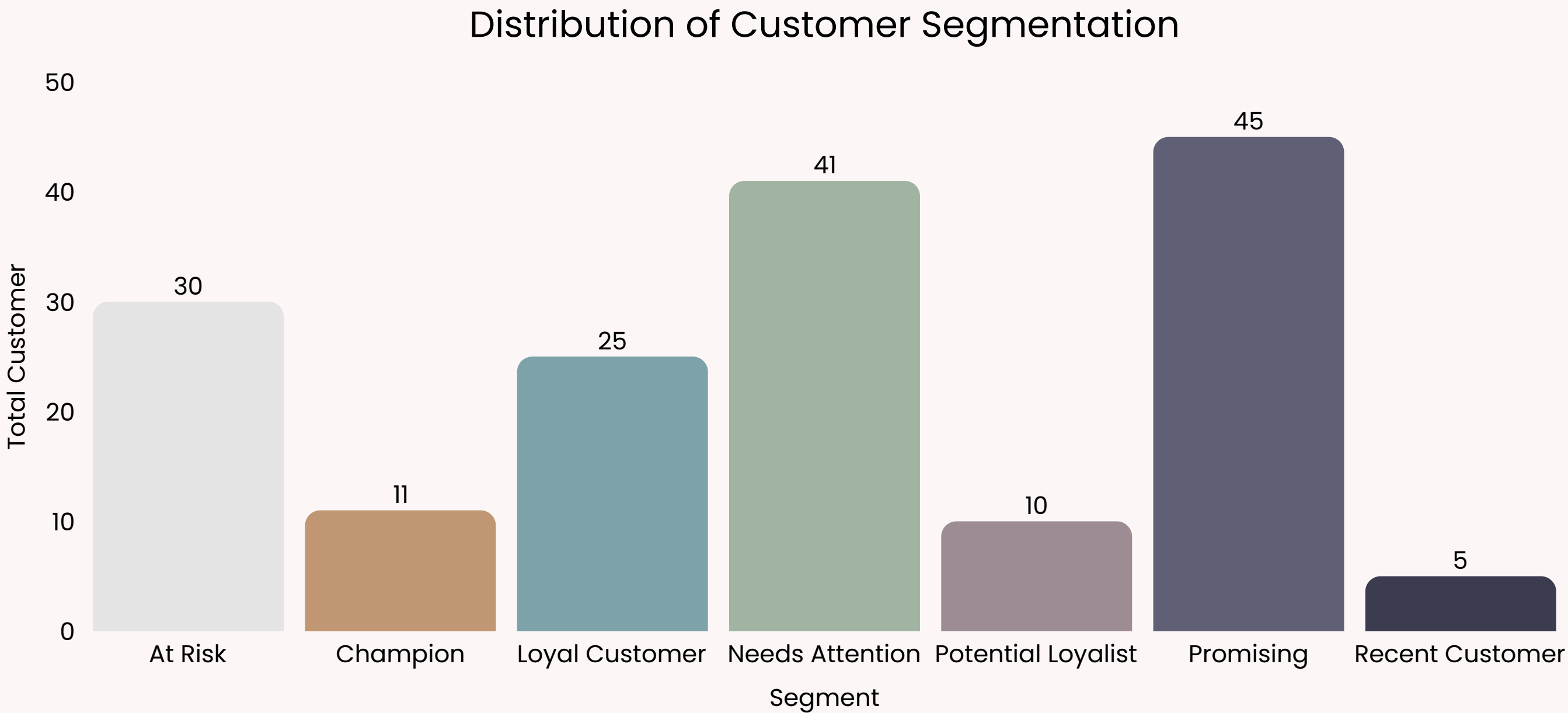
RECENCY, FREQUENCY, AND MONETARY

R: How recent was the customer's last purchase; F: How often the customer made transactions within a certain period, The total amount of money spent by the customer during the observation period.

	Recency Score	5	4	3	2	1
RECENCY	Recency Cutoff		41 days	62 days	102 days	194 days

	Frequency Score	1	2	3	4	5
FREQUENCY	Frequency Cutoff		1x	1x	1x	1x

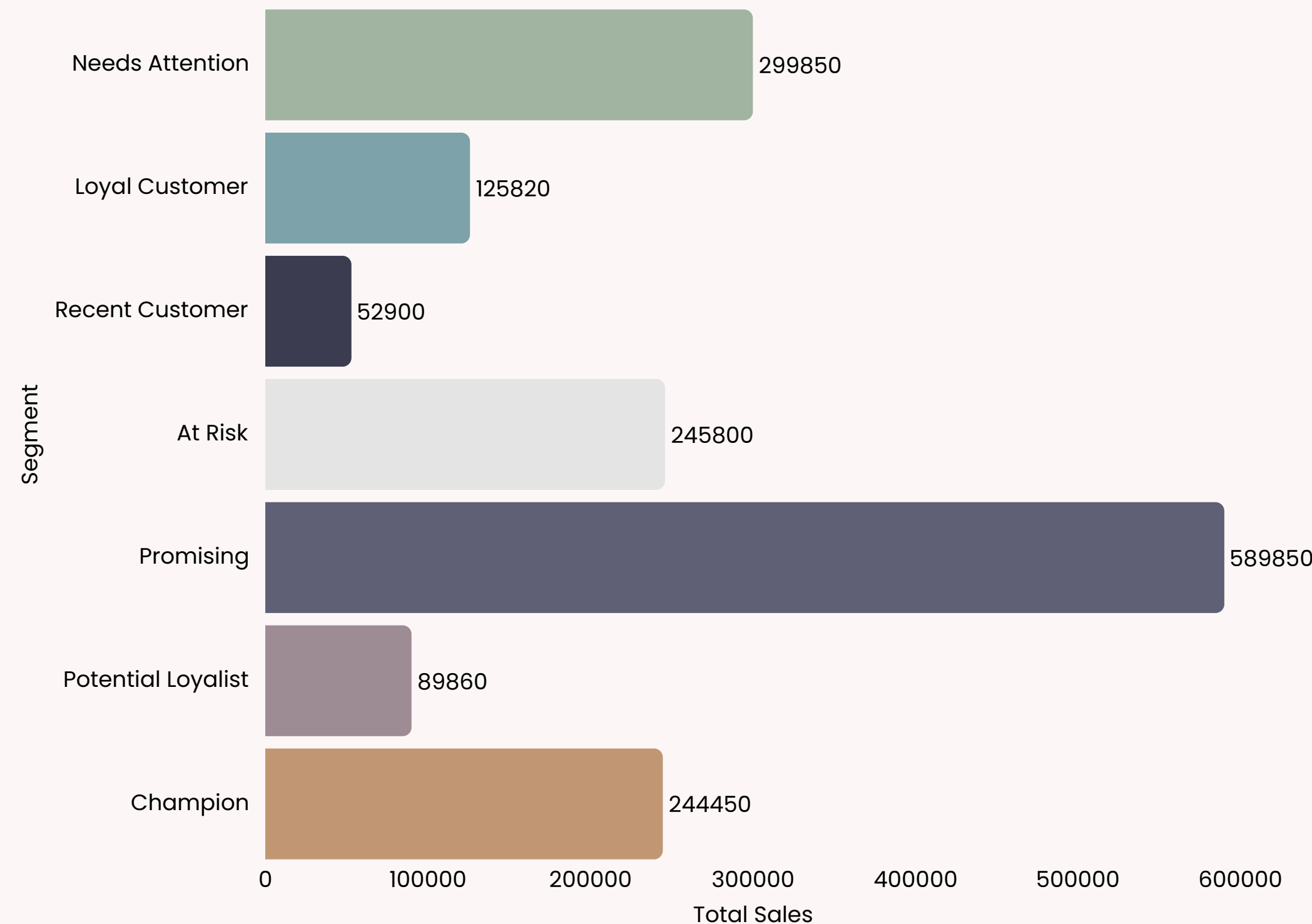|	Monetary Score	1	2	3	4	5
MONETARY	Monetary Cutoff		Rp 1.210 (Mil)	Rp 2.500 (Mil)	Rp 5000 (Mil)	Rp 15.400 (Mil)

DISTRIBUTION OF SEGMENTATION

For clarity, consistency, and measurable business insight, the rfm analysis only includes users and events leading up to the "purchase" action.

Distribution of Customer Segmentation

RFM analysis shows that customers fall into several key segments, with the largest groups being Promising (45 users) and Needs Attention (41 users). This indicates many customers are somewhat engaged but not yet loyal. Loyal Customers (25 users) and Champions (11 users) form the high-value core, while At Risk (30 users) suggests a sizable portion is becoming inactive and needs re-engagement.

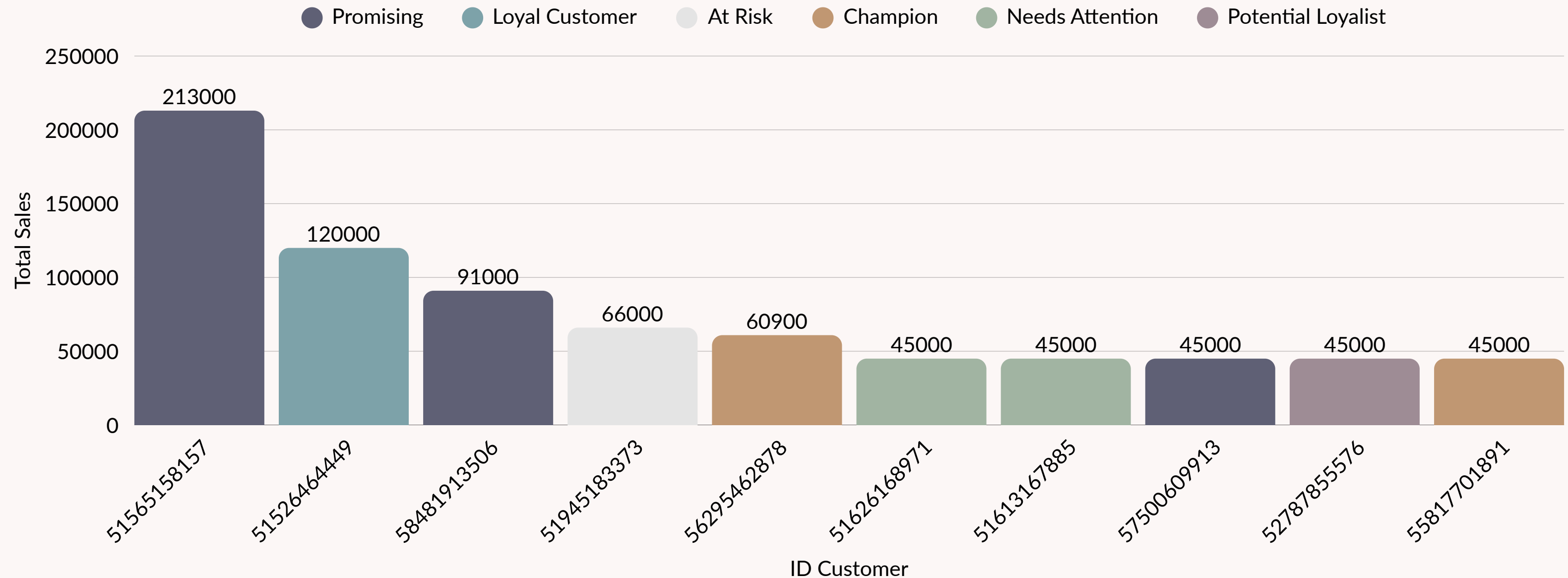# DISTRIBUTION OF TOTAL SALES BY SEGMENT

To know which customer segments contribute the most to total sales

- Promising contributes the most to sales, showing great potential to be converted into loyal customers.
- Needs Attention and At Risk also contribute significantly to sales, but show a risk of declining engagement, requiring retention strategies.
- Champions remain a high-value segment with stable spending.
- Other segments such as Loyal Customers, Potential Loyalists, and Recent Customers contribute less, so they can be targeted for upsell/cross-sell programs.

TOP 10 SPENDER

Top 10 Customers

● Promising   ● Loyal Customer   ● At Risk   ● Champion   ● Needs Attention   ● Potential Loyalist

- Promising segment contributes the largest spenders has the potential to become Champions if given promotions/loyalty programs.
- Loyal Customers need to be retained with regular engagement.
- High sales concentration on a handful of customers; VIP treatment and personalized offers strategies can increase their long-term value.

CONCLUSION

This is the summary of this project

with a major drop-off from Product View to Add to Cart (32%), indicating weak initial product engagement despite a perfect Checkout → Purchase conversion (100%).

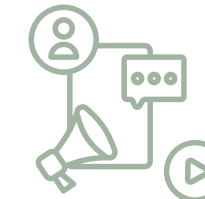**The biggest bottleneck occurs early in the funnel**

where most revenue comes from a small set of high-value users (Promising, At Risk, Champions), while many others fall into Needs Attention and At Risk segments, signaling high churn risk

Customer value is uneven

but high-value segments like Champions and Loyal Customers remain crucial for long-term revenue stability

RFM analysis shows that Promising and Needs Attention dominate

making them the top priority for conversion into Loyal or Champion users, while At Risk users require reactivation strategies

Promising customers contribute the most sales

Improving product pages, strengthening social proof, and applying RFM-based marketing are key strategies to enhance conversion, retention, and customer lifetime value.
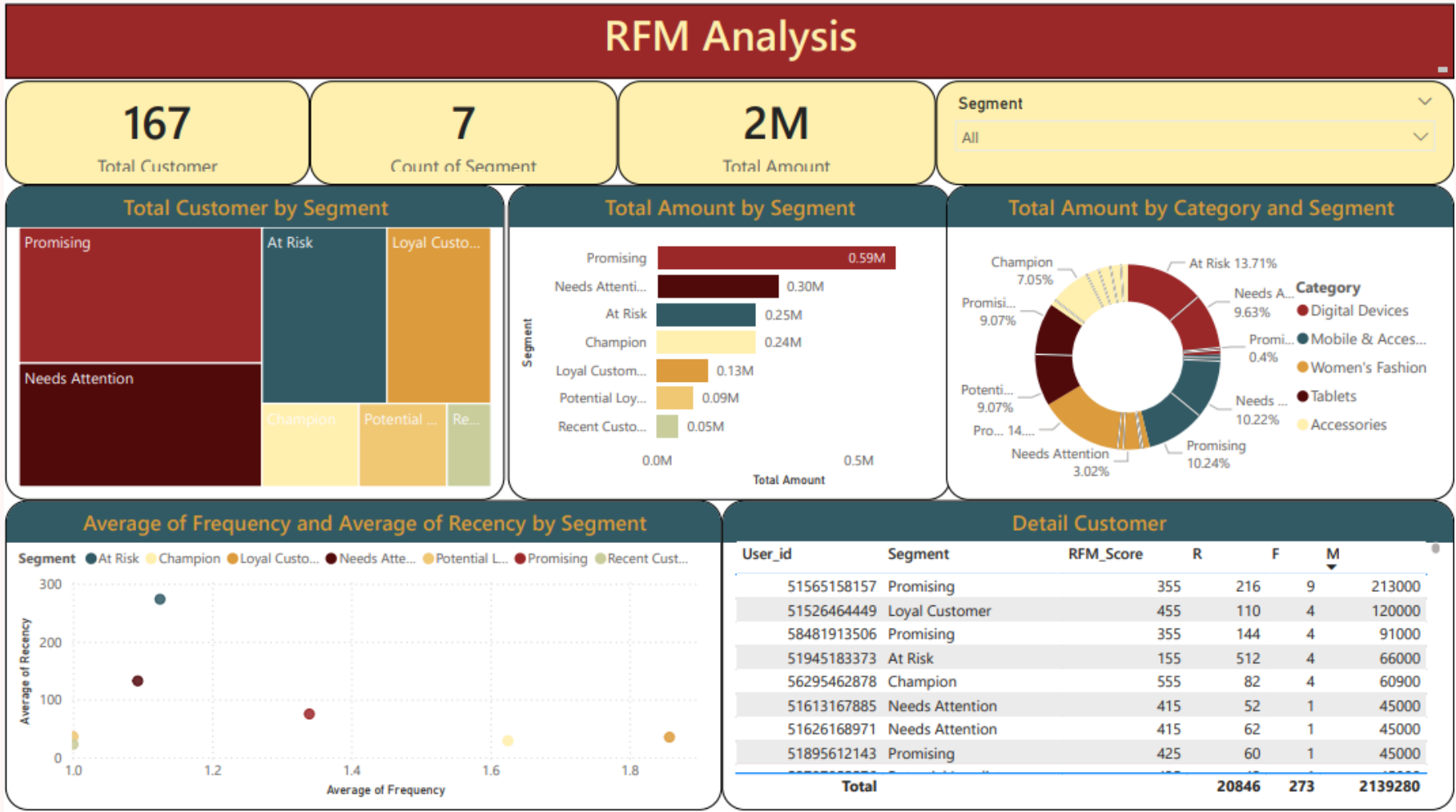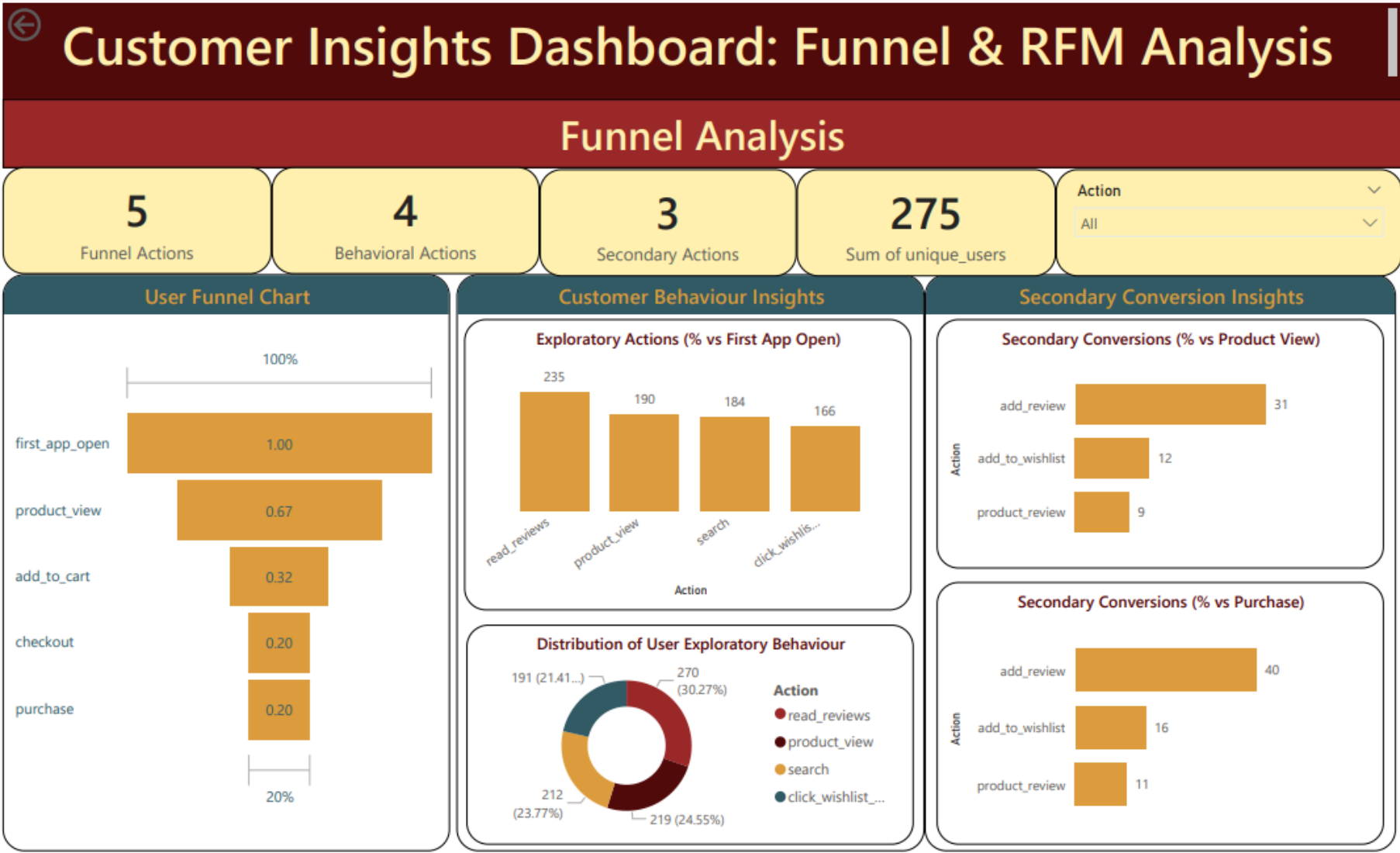
Key Strategies

RECOMMENDATION

Here are some recommendations based on the results of funnel analysis and RFM analysis.

Enhance Product Pages

Improve visuals, descriptions, highlight key benefits, and enhance product visuals to reduce the largest drop-off.

Reduce Friction in Add-to-Cart → Checkout

Display shipping estimates early, enable "Buy Now," and send cart reminders to recover potential buyers.

Leverage Engagement Features (Reviews & Wishlist)

Incentivize customers to write reviews and use wishlist data for targeted promotions and price-drop alerts.

Use RFM Insights for Targeted Marketing

Promote Promising users into Loyal via personalized deals

Use RFM Insights for Targeted Marketing

Re-engage At Risk & Needs Attention customers with win-back offers

Use RFM Insights for Targeted Marketing

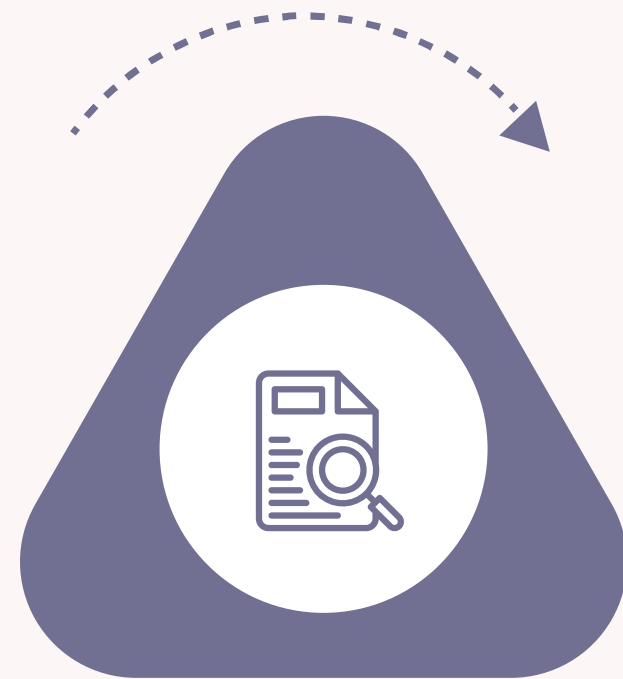Reward Champions & Loyal buyers with exclusive benefits to increase retention

DASHBOARD

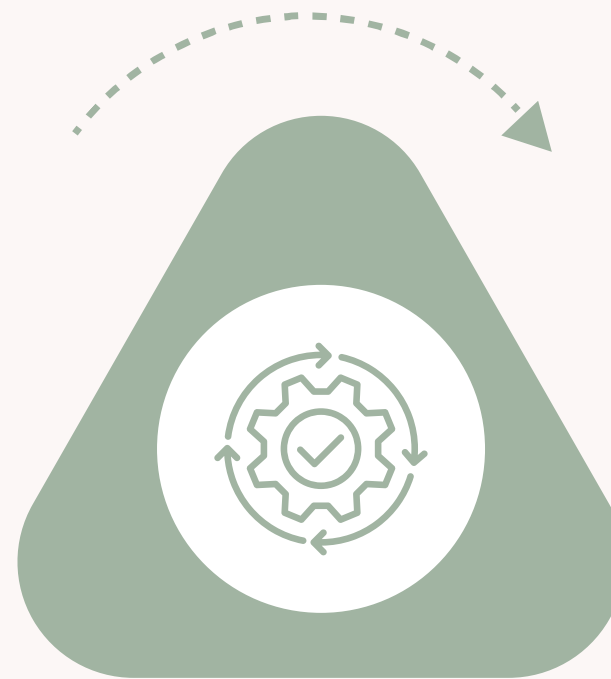

Developed using Microsoft Power BI

CONTACT ME ON

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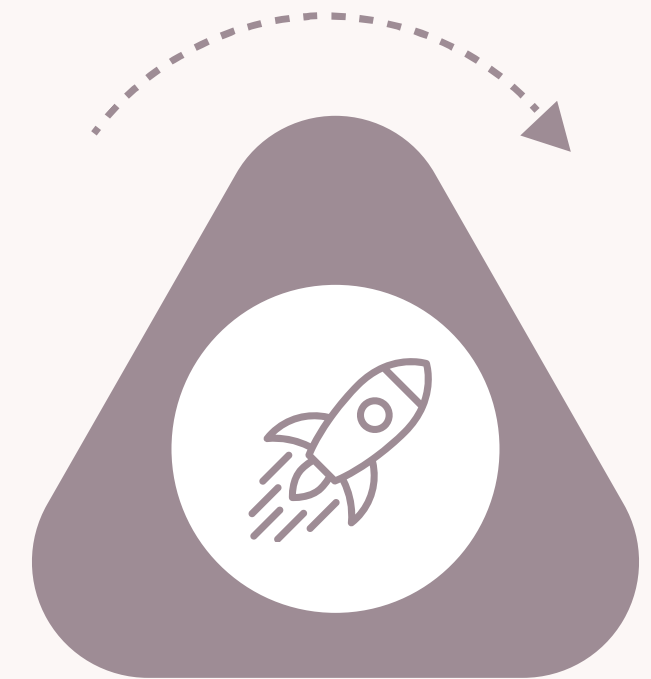www.linkedin.com/in/rahma-anggana-rarastyasa

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THANK YOU