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LABORATORY 3:
AI-ASSISTED CONSUMER
BEHAVIOR ANALYSIS
(SHOPEE VS. TIKTOK SHOP)

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Introduction

This laboratory report analyzes a simulated dataset capturing online shopping behavior on Shopee and TikTok Shop. The primary goal is to examine how AI-driven recommendation systems, product visibility, and platform engagement affect consumer actions such as session duration, product clicks, add-to-cart behavior, and completed purchases.

Objectives:

- Perform data exploration and analysis using Excel and Jupyter Notebook.
- Compute and interpret key consumer behavior metrics, including conversion rate and engagement rate.
- Identify trends and relationships between AI interaction, customer satisfaction, and purchase likelihood.
- Compare engagement efficiency and sales conversion between Shopee and TikTok Shop.

Tools Used:

Microsoft Excel (for descriptive statistics and conversion rates)

Jupyter Notebook (Python) with pandas, numpy, matplotlib, and seaborn libraries

Data Overview

Dataset Name: Lab3_ConsumerBehavior_Shopee_vs_TikTokShop.csv

Number of Records: 100

Column Descriptions:

Column	Description
Platform	The e-commerce platform used (Shopee or TikTok Shop).
User ID	Unique identifier assigned to each shopping session.
Age	Age of the user.
Gender	Gender of the user.
Monthly Income Level	Income category of the user (Low, Middle, or High).
Session Duration (mins)	Total time spent by the user during the session.



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Products Viewed	Number of products the user viewed or clicked on.
AI Recommendation Clicks	Number of clicks on AI-recommended products.
Items Added to Cart	Count of items the user added to their shopping cart.
Items Purchased	Indicates if the user made a purchase
Customer Satisfaction (1-5)	Satisfaction rating (1 = lowest, 5 = highest)

Figure 1.1 Dataset Information

Findings (Excel)

Descriptive statistics were computed in Excel to compare the average performance of each platform.

Table 1: Key Metrics per Platform

Descriptive Analysis	Shopee	TikTok Shop
Avg. Session Duration (mins)	47.04	27.20
Avg. Items Added to Cart	4.20	1.56
Avg. AI Recommendation Clicks	6.06	2.54
Avg. Items Purchased	0.98	0.48
Conversion Rate*	16.17%	18.90%

Figure 2.1 Key Metrics Per Platform

The data from the Excel analysis shows that Shopee leads TikTok Shop in all key engagement and conversion metrics. Shopee users, on average, spend significantly more time in the app (47.04 vs. 27.20 minutes), click on more AI recommendations (6.06 vs. 2.54), add more items to their cart (4.20 vs. 1.56), and purchase nearly twice as many items (0.98 vs. 0.48).



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Excel Chart 1: Engagement Comparison



Figure 3.1 Engagement Comparison

This chart clearly shows that Shopee users are more engaged. Shopee leads in average session duration with **47.04 minutes** compared to TikTok Shop's **27.20 minutes**. Furthermore, Shopee users interact more with AI, averaging **6.06 recommendation clicks**, while TikTok Shop users average only **2.54**.

Excel Chart 2: Purchase Rate vs. AI Clicks

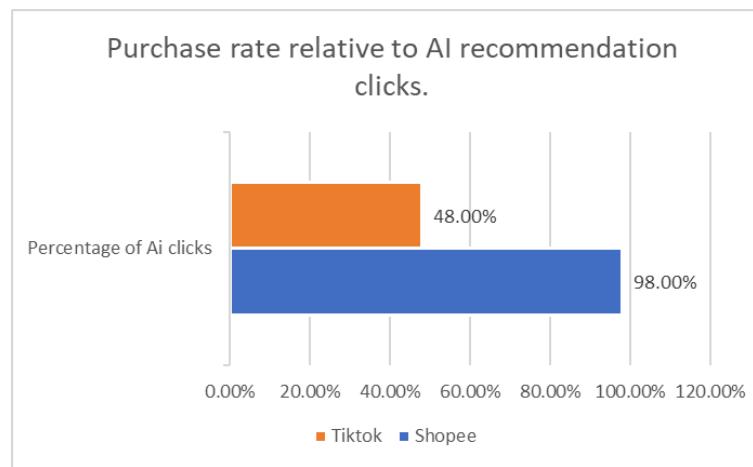


Figure 3.2 Purchase rate

This chart demonstrates that Shopee's AI recommendations are more effective at driving sales. For highly engaged users, Shopee achieves a purchase rate of **98%**. This is double the rate of TikTok Shop, which only converts **48%** of its highly engaged users.



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Findings (Jupyter Notebook)

The analysis was extended in a Jupyter Notebook using Python libraries for deeper visualization

Visualization 1: Correlation Heatmap

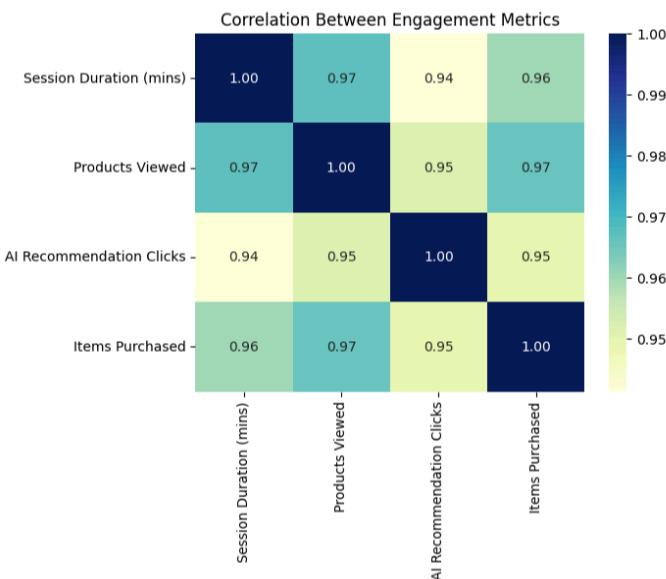


Figure 4.1 Correlation Heatmap

The heatmap reveals extremely strong positive correlations between all engagement metrics. For instance, Session Duration and Products Viewed have a correlation of 0.97, while Session Duration and Items Purchased are at 0.96. A similarly strong positive correlation of 0.95 exists between AI Recommendation Clicks and Items Purchased, showing that users who engage with recommendations tend to buy more. This visual demonstrates how strongly different user activities are connected; longer time spent in the app is linked to viewing more products, clicking AI suggestions, and ultimately, buying more items.

Visualization 2: Average Items Purchased by Platform

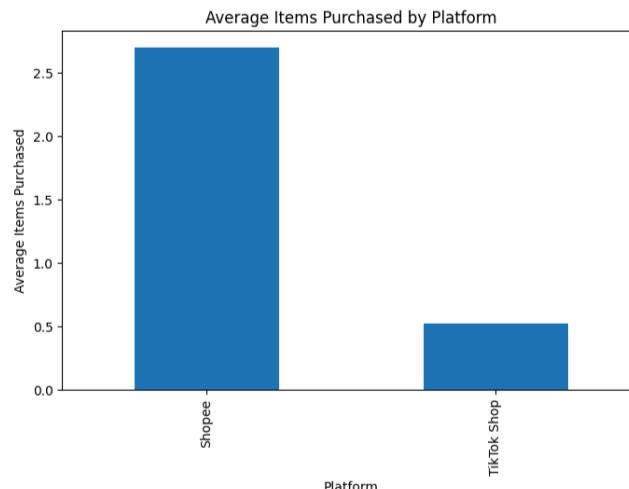


Figure 4.2 Bar Chart



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This bar chart, which compares the average items purchased by platform, clearly indicates that Shopee users purchase more items on average. TikTok Shop users purchase noticeably fewer items in comparison. The conclusion from this visual is that Shopee's platform or strategy encourages customers to complete more purchases per session.

Visualization 3: AI Recommendation Clicks vs. Items Purchased

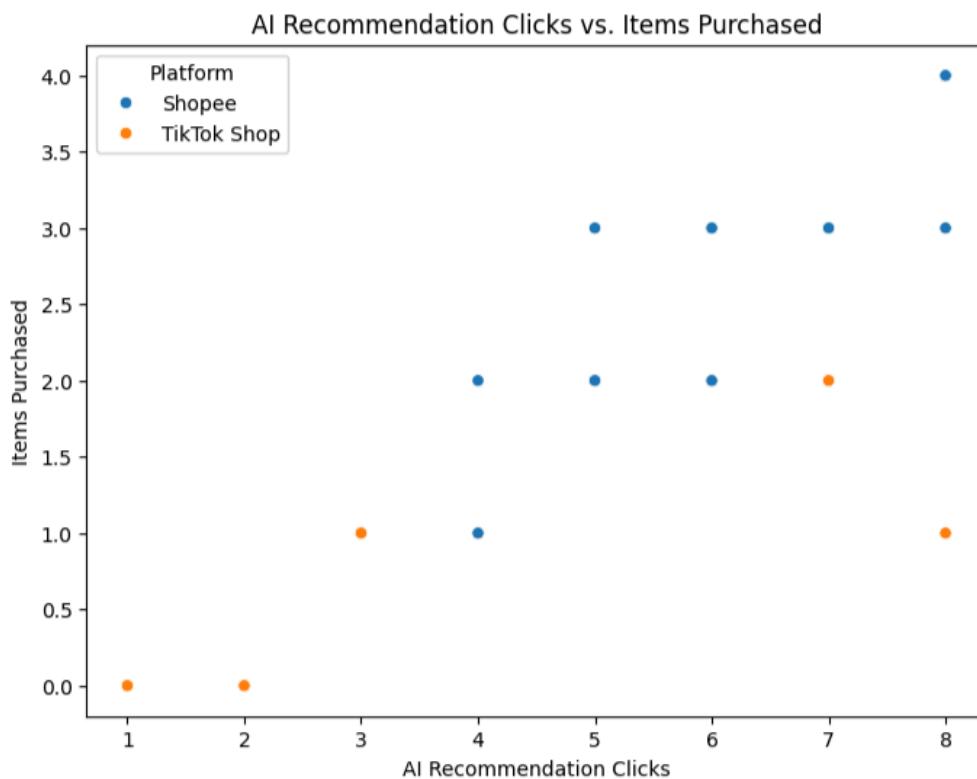


Figure 4.3 Scatter Plot

Finally, the scatter plot illustrates the link between clicks on AI recommendations and the number of items purchased on both Shopee and TikTok Shop. The plot shows that while users on both platforms click on recommendations, Shopee users tend to purchase more items after doing so. Conversely, TikTok Shop users also click on recommendations but purchase fewer items overall. This suggests that Shopee's product recommendations are more effective in prompting a purchase than those on TikTok Shop.

Insights Summary

Based on the analysis, a complex picture emerges of two distinct shopping behaviors. Shopee is the clear leader in user engagement. The data shows Shopee users spend significantly more time on the platform, with an average session duration of 47.04 minutes compared to 27.20 minutes for TikTok Shop. This deep engagement is also reflected in interaction with AI, where Shopee users average 6.06



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recommendation clicks, more than double TikTok Shop's 2.54, and add far more items to their cart (4.20 vs. 1.56). This indicates that users on Shopee are more deeply involved in browsing, comparing, and interacting with the platform's features.

However, this high engagement does not translate to the most efficient sales. The data reveals that TikTok Shop has a better conversion efficiency, with a rate of 18.90% compared to Shopee's 16.17%. This key insight suggests that while Shopee drives more "window shopping" and browsing, TikTok's platform is more effective at converting a user's discovery into an "impulse buy." Even with lower overall engagement, TikTok's users appear to follow a more direct and efficient path from seeing a product to completing the purchase.

Guide Question Answers

1. Which platform—Shopee or TikTok Shop—shows higher customer engagement? Provide supporting evidence.

Shopee shows significantly higher customer engagement. Evidence from the analysis shows Shopee users have a much longer average session duration (47.04 minutes vs. 27.20 minutes for TikTok Shop), click on more AI recommendations (6.06 vs. 2.54), and add more items to their cart (4.20 vs. 1.56).

2. Do users who interact more with AI-generated recommendations exhibit a higher likelihood of purchase? Explain using data.

Yes, they do. The heatmap analysis shows a very strong positive correlation of 0.95 between AI Recommendation Clicks and Items Purchased.

3. What behavioral patterns (e.g., clicks, time spent, cart additions) strongly correlate with successful purchases?

All measured engagement metrics show a very strong correlation with successful purchases. The heatmap indicates:

- Session Duration: 0.96 correlation with Items Purchased
- Products Viewed: 0.97 correlation with Items Purchased
- AI Recommendation Clicks: 0.95 correlation with Items Purchased



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4. How do customer demographics (age, income level, spending habits) influence buying behavior across the two platforms?

Income Level: Higher income directly correlates with a higher purchase rate. On Shopee, 'Middle' and 'High' income users had a 100% purchase rate (vs. 0% for 'Low'), while TikTok Shop's rate jumped from 7.1% ('Low') to 100% ('Middle').

Age: The purchase rate increases with age. On Shopee, the rate rose from 83.3% for ages 21-25 to 100% for ages 26 and older. TikTok Shop showed a similar trend, rising from 29.6% (21-25) to 100% (31-35).

Spending Habits: Users who add more items to their cart are far more likely to buy. This behavior was most common in the older and higher-income groups that also had the highest purchase rates (Shopee's 36-40 age group added 5.20 items vs. 2.83 for ages 21-25).

5. Which platform demonstrates better conversion efficiency from browsing to purchase, and what factors contribute to this?

Shopee demonstrates less conversion efficiency, with a conversion rate of 16.17% compared to TikTok Shop's 18.90%. It suggests that while Shopee users have higher engagement (longer sessions, more AI clicks), that engagement may not be as sales-focused. Users might be "window shopping" or comparing prices. TikTok's platform, by contrast, appears to be more effective at creating an "impulse buy" environment. Even with lower overall engagement, its users' path from discovery to purchase is more direct and efficient, leading to a higher conversion rate.