Predictive Analysis of Operational Performance and Customer Satisfaction in a Quick Service Restaurant

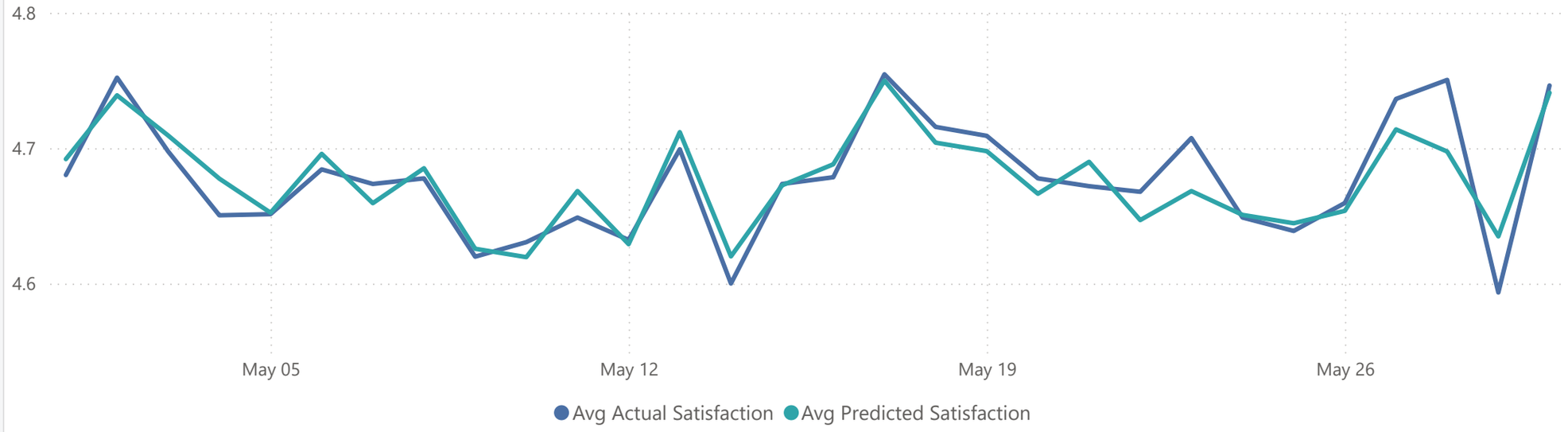
EXECUTIVE OVERVIEW

4.678	4.677	0.18	3630
Avg Actual Satisfaction	Avg Predicted Satisfaction	Avg Prediction Error	Total Orders

filter: date

5/1/2024 5/30/2024

Performance Over Time



filter: satisfaction

- [ ] high
- [ ] medium

filter: menu item

- [ ] Burger
- [ ] Fries
- [ ] Pasta
- [ ] Pizza
- [ ] Salad
- [ ] Soda

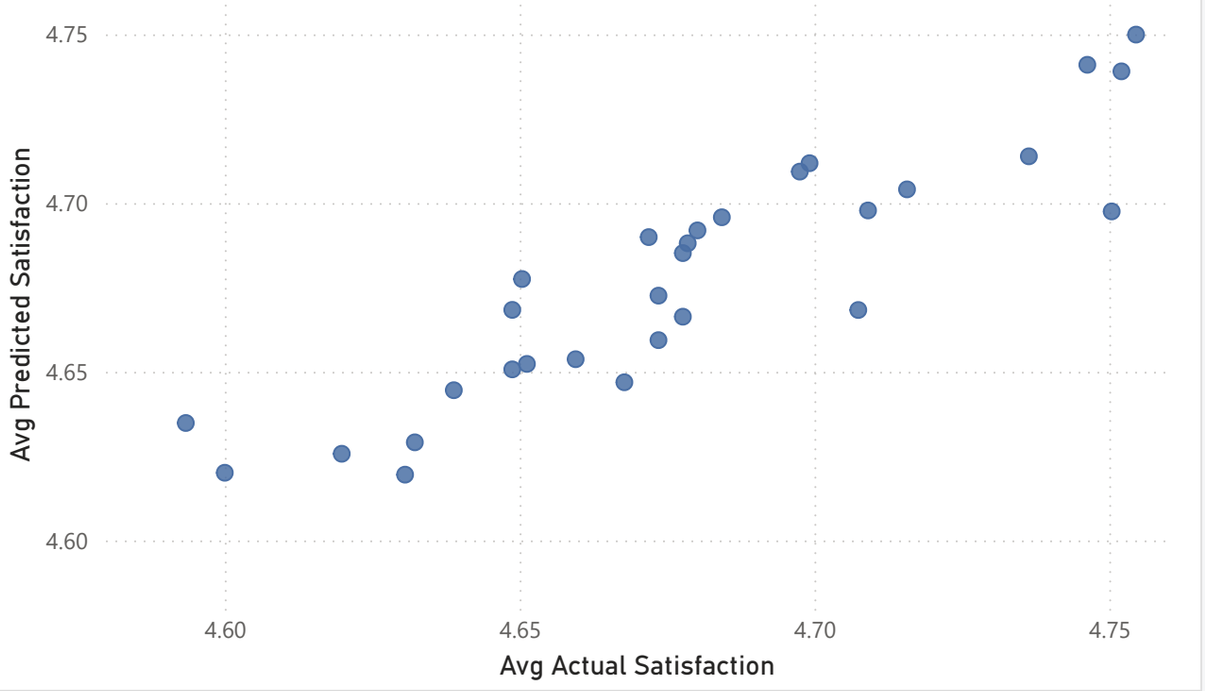
Insight:

- The predictive model demonstrates high accuracy, with **Avg Predicted Satisfaction (4.677)** closely aligned with **Avg Actual Satisfaction (4.678)**, indicating that the model is sufficiently stable for daily operational monitoring.
- There is no significant gap between actual and predicted trends, suggesting the absence of systematic model bias.
- With a total of **3,630 orders**, the analysis is supported by a sufficiently large dataset for operational decision-making.
- The low **Avg Prediction Error (0.18)** indicates that prediction errors remain within an acceptable range for the restaurant business context.

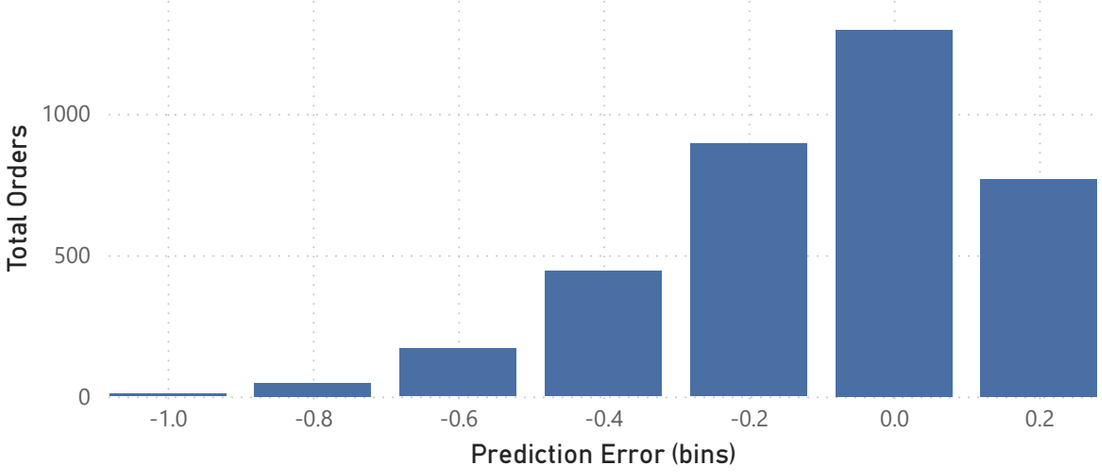
Predictive Analysis of Operational Performance and Customer Satisfaction in a Quick Service Restaurant

ACTUAL VS PREDICTED PERFORMANCE

Scatter: Actual Satisfaction vs Predicted Satisfaction



Histogram Prediction Error



Top Prediction Error

Order ID	Date	Actual Satisfaction	Predicted Satisfaction	Predicti
20240516-1510	Thursday, May 16, 2024	5.00	5.95	
20240515-1220	Wednesday, May 15, 2024	5.00	5.92	
20240507-1600	Tuesday, May 07, 2024	2.50	3.37	
20240518-1155	Saturday, May 18, 2024	5.00	5.85	
20240504-1930	Saturday, May 04, 2024	5.00	5.84	
20240513-1810	Monday, May 13, 2024	5.00	5.82	
20240506-1950	Monday, May 06, 2024	5.00	5.81	
20240510-1550	Friday, May 10, 2024	2.60	3.41	

Insight:

- The Actual vs. Predicted scatter plot shows a pattern closely aligned with the diagonal line, confirming the model's ability to effectively capture customer satisfaction patterns.
- The distribution of prediction errors is concentrated around zero, indicating no widespread extreme overprediction or underprediction.
- The "Top Prediction Error" table indicates that the largest errors occur in orders with extreme (very high) satisfaction levels, which is expected given the inherently subjective nature of customer satisfaction.

Predictive Analysis of Operational Performance and Customer Satisfaction in a Quick Service Restaurant

KEY OPERATIONAL DRIVER

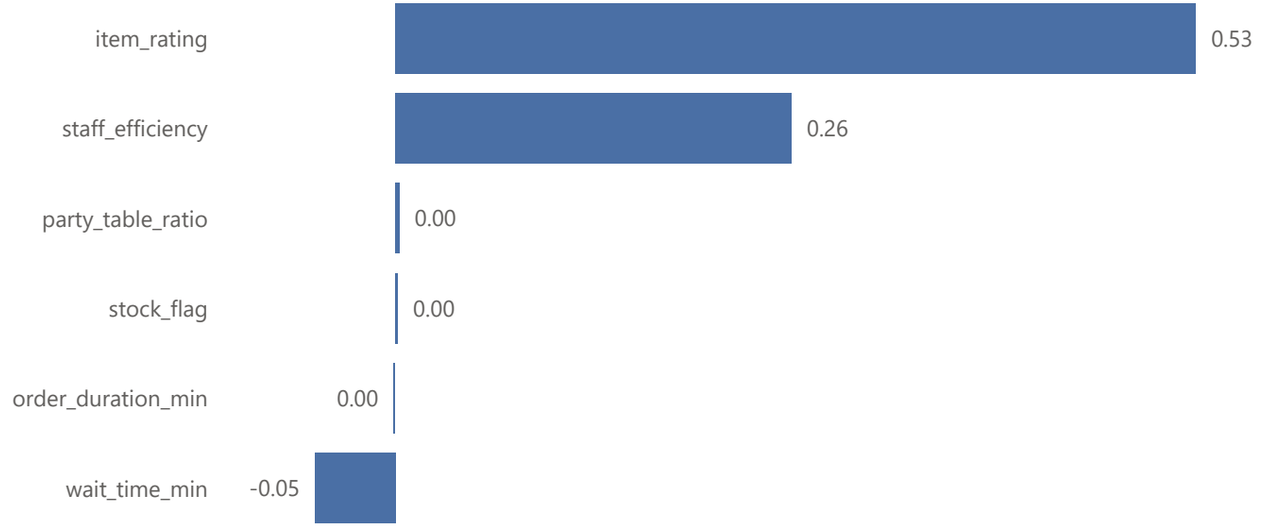
Customer Satisfaction by Staff on Duty

Customer Satisfaction by Menu Item

Heatmap Correlation

index	Cust Satisfaction	Item Rating	Order Duration	Party Table Ratio	Staff Efficiency	Wait Time
Cust Satisfaction	1.00	0.58	-0.10	-0.06	0.58	-0.31
Item Rating	0.58	1.00	-0.01	-0.01	0.00	-0.02
Order Duration	-0.10	-0.01	1.00	0.15	-0.01	0.26
Party Table Ratio	-0.06	-0.01	0.15	1.00	-0.01	0.18
Staff Efficiency	0.58	0.00	-0.01	-0.01	1.00	-0.01
Wait Time	-0.31	-0.02	0.26	0.18	-0.01	1.00

Model Coefficients



Predictive Analysis of Operational Performance and Customer Satisfaction in a Quick Service Restaurant

WHAT-IF SCENARIO SIMULATION

4.678	4.678	0.00
Baseline Satisfaction	Scenario Satisfaction	Satisfaction Delta

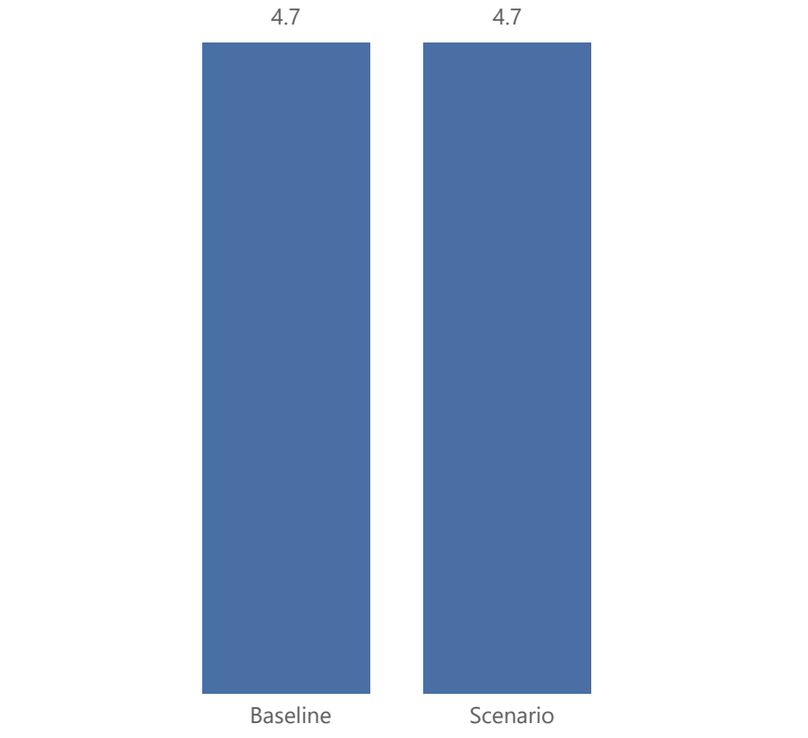
Staff Efficiency Adjustment

0.00

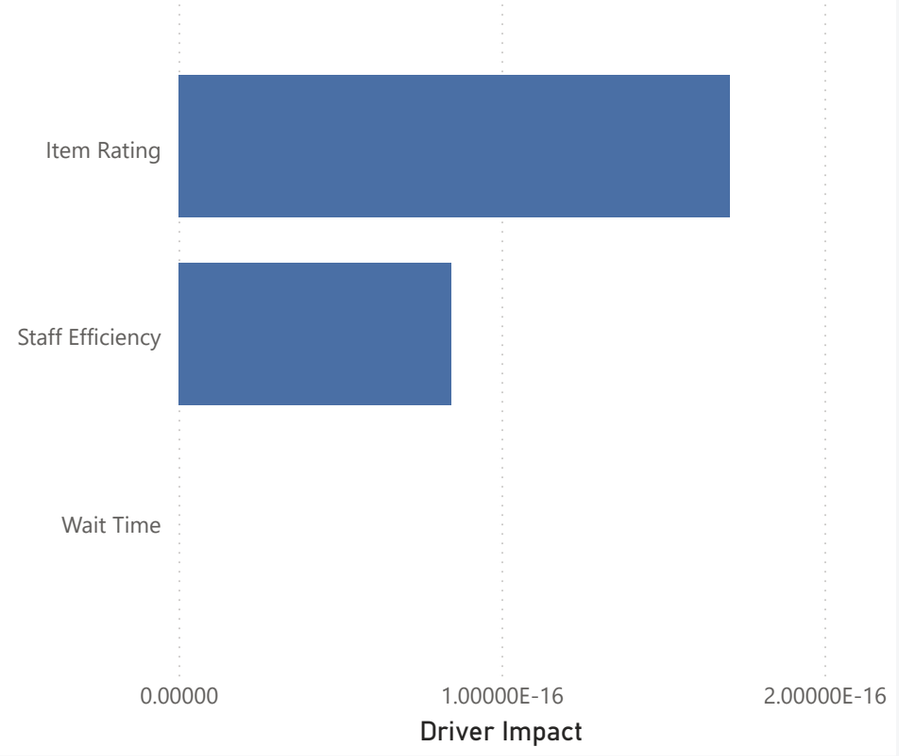
Item Rating Adjustment

0.00

Before vs After - Satisfaction



Driver Sensitivity



Wait Time Adjustment

0.00

Insight :

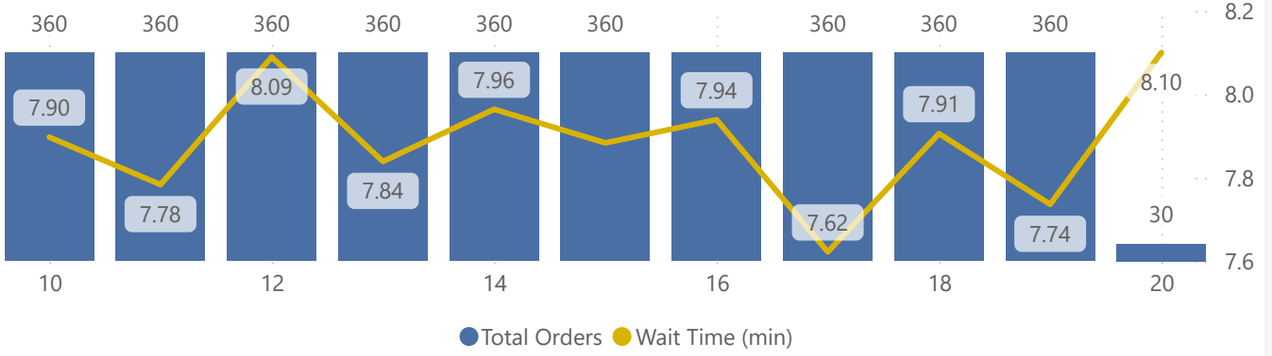
- The simulation results indicate that moderate operational changes do not produce a significant satisfaction delta, suggesting that the restaurant's baseline performance is already relatively stable.
- Driver sensitivity analysis confirms that **Item Rating** has the strongest impact on customer satisfaction, followed by **Staff Efficiency**, while **Wait Time** has a relatively smaller effect.
- This implies that improving product quality and service effectiveness is more impactful than focusing solely on speeding up operational processes.

Predictive Analysis of Operational Performance and Customer Satisfaction in a Quick Service Restaurant

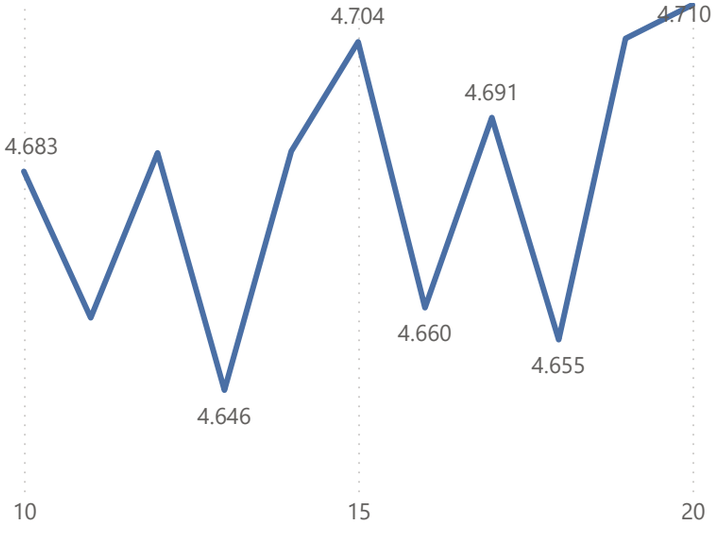
OPERATIONAL INSIGHT

Staff	Wait Time (min)	Staff Efficiency	Customer Satisfaction	Total Orders
Alice	7.71	7.97	4.69	713
Bob	8.00	8.03	4.69	721
Charlie	7.90	8.01	4.66	728
Diana	7.87	8.05	4.69	763
Eve	7.85	7.97	4.67	705

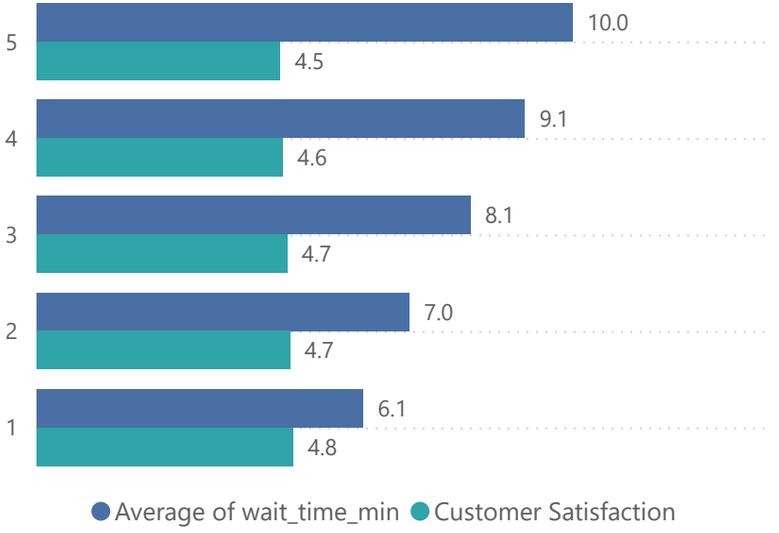
Total Orders & Wait Time (min) by Hour



Customer Satisfaction by Hour



Wait Time and Customer Satisfaction by Party Sze



Item Rating and Customer Satisfaction by Menu Item