PROJECT BRIEF

PROJECT NAME: Customer Behavior Analytics

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SUMMARY

In today's competitive hospitality sector, customer retention is as critical as acquisition. This project delivers an AI-driven churn prediction and recommendation platform that helps hotels forecast cancellations, explain customer behavior, and optimize retention ROI.

OBJECTIVES

- Predict hotel booking churn with high accuracy.
- Explain why customers churn using SHAP interpretability.
- Group customers into behavioral personas for marketing focus.
- Quantify the financial return of targeted retention strategies

APPROACH

- Data Sources : Hotel Booking Dataset + TripAdvisor Reviews
- Feature Engineering : 50+ behavioral & temporal features
- Models : Logistic Regression, Random Forest, XGBoost
- Explainability : SHAP (global & local)
- Segmentation : K-Means on churn risk + engagement
- ROI Simulation : Linked uplift vs. discount to financial impact

KEY FINDINGS

- Top Churn Drivers : High ADR, Long Lead Time, Booking Instability
- Best Model : Random Forest (AUC ≈ 0.89)
- Personas : 1. Frequent Leisure Travelers
  2. Corporate Bookers
  3. Family Vacationers
- ROI Impact : 20% uplift + 5% discount → ₹45M net ROI

CONCLUSION

The platform bridges technical modeling and business strategy – transforming churn analysis into actionable financial insights. It demonstrates how interpretable ML and ROI simulation can drive data-backed decision-making in customer retention.

IMPACT

1. **Predictive churn scores for proactive retention**

2. **Transparent feature drivers (SHAP) for trust**

3. **Persona-led campaigns for personalization**

4. **ROI model linking data science → Business value**