Indian Institute of Technology Guwahati
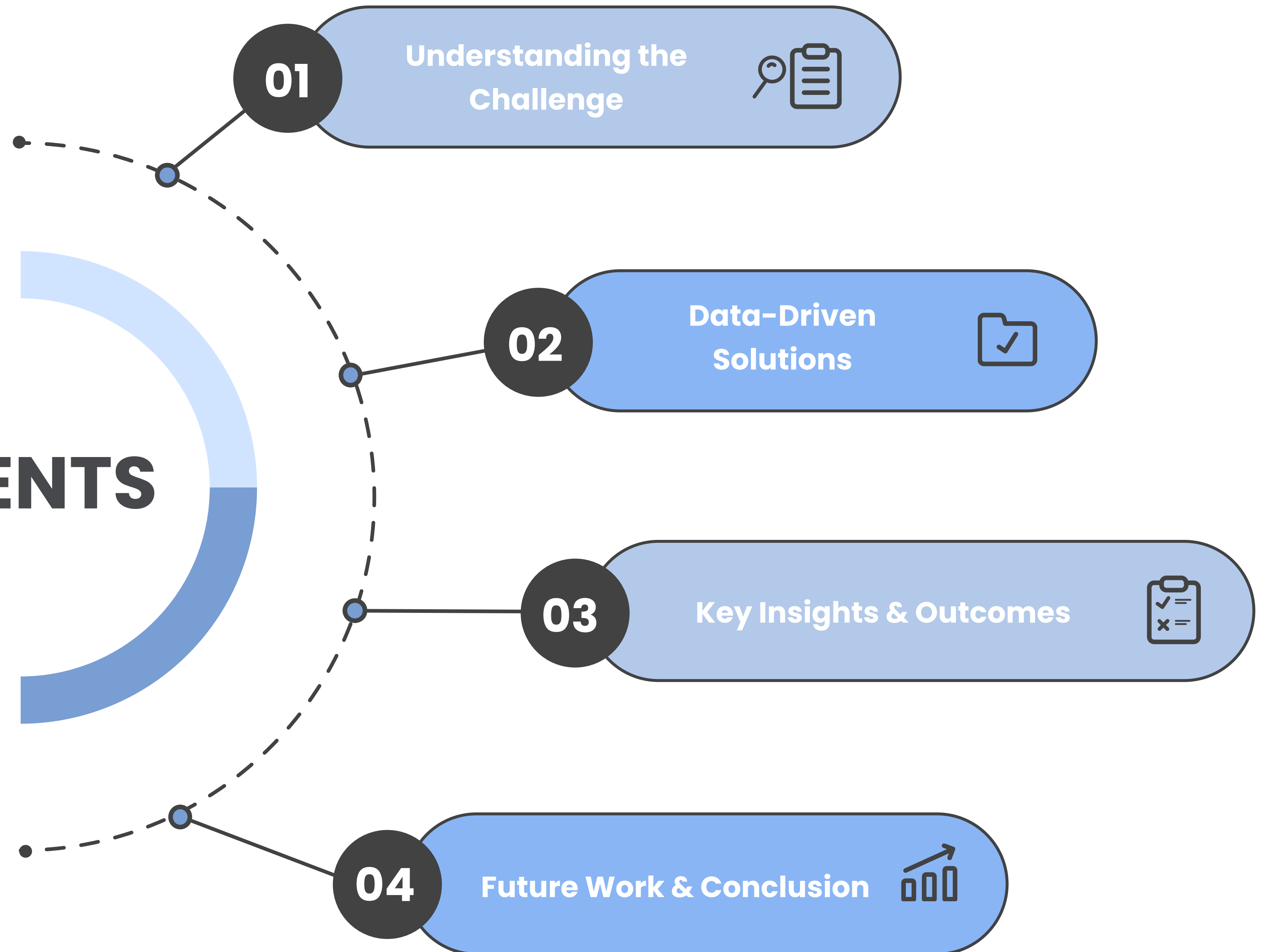
KRACK THE HACK

Smart Hospitality Solutions with Predictive Analytics

Leveraging data to optimize pricing, reduce cancellations, and enhance guest experiences.

By - Triad of Trends

CONTENTS

Hospitality

Key Focus Areas

Revenue Management and Pricing Optimization: Implement dynamic pricing strategies & revenue management techniques based on demand forecasting & market trends.

Booking Cancellation Prediction: Implement predictive models to estimate the likelihood of booking cancellations, allowing for optimized resource allocation and improved operational efficiency.

Customer Segmentation and Service Management: Develop a model for segmenting customers to enhance service management and personalization based on their distinct needs and preferences.

Demand Forecasting and Promotional Strategy: Create a model that identifies peak periods for targeted promotions to maximize revenue and recognizes slow periods for strategic offers to boost occupancy and revenue.

Data-Driven Solutions for Dynamic Hospitality

Dynamic Pricing :

- **Features Utilized:** Selected relevant features from historical booking data and engineered new features to enhance model performance.
- **Model Used:** XGBoost, chosen for its effectiveness in handling complex relationships and feature interactions in the dataset.

Cancellation Prediction:

- **Features Utilized:** Created new features through thorough data cleaning and feature engineering.
- **Model Used:** Neural Network, selected for its ability to capture intricate patterns and dependencies in the data.

Customer Segmentation:

- **Features Utilized**: Used both existing and newly created features to improve segmentation accuracy.
- **Model Used:** K-Nearest Neighbors (KNN), employed for its effectiveness in clustering customers based on similarities in preferences and behaviors.

Demand Forecasting:

- Approach: Analyzed daily booking counts and timing of bookings to detect promotional activities and trends.
- Outcome: Developed a demand forecasting model to predict high and low demand periods, aiding in optimal event scheduling and promotions.

Event & Promotion Strategy:

- **Analysis:** Identified event periods by examining booking data for high occupancy dates and correlating them with events or peak seasons.
- **Promotion Detection:** Analyzed consecutive peak booking days to pinpoint periods for promotional activities, ensuring alignment with high-occupancy events.
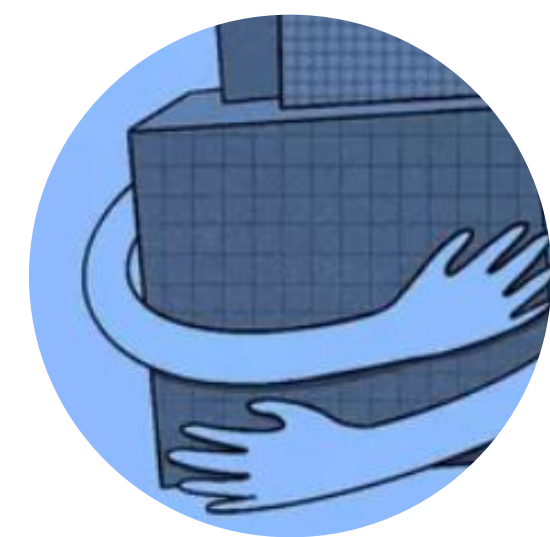
Customer Review Analysis:

- **Objective:** Intended to develop a model to process customer reviews and generate actionable suggestions for improving services and maintenance.
- **Challenge:** Computational constraints prevented the completion of this model, limiting our ability to provide real-time recommendations from customer feedback.

Key Insights & Outcomes

Event Timing: Recommends when to conduct entertaining events and special promotions to maximize occupancy and revenue.

Dynamic Pricing : Helps optimize profitability by adjusting room rates based on demand.

Customer Segmentation: Enables personalized marketing and service strategies.

Events, Promotions & Pricing

Cancellation Prediction: Minimizes resource waste by predicting cancellations in advance.

Promotions & Offers: Suggests when to run promotions during off-peak times to maintain consistent revenue flow.

Review Insights: Provides actionable feedback for improving services and boosting customer satisfaction.

Dynamic Pricing　　　Cancellation Prediction　　　Customer Segmentation　　　Demand Forecasting　　　Event & Promotion Strategy

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THANK YOU

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