Agentic Guest Experience Optimizer

Team Claptac

Our Solution

PREDICT SATISFACTION BEFORE THE STAY BEGINS

AUTO-GENERATE PERSONALIZED, CONTEXT-AWARE EMAILS
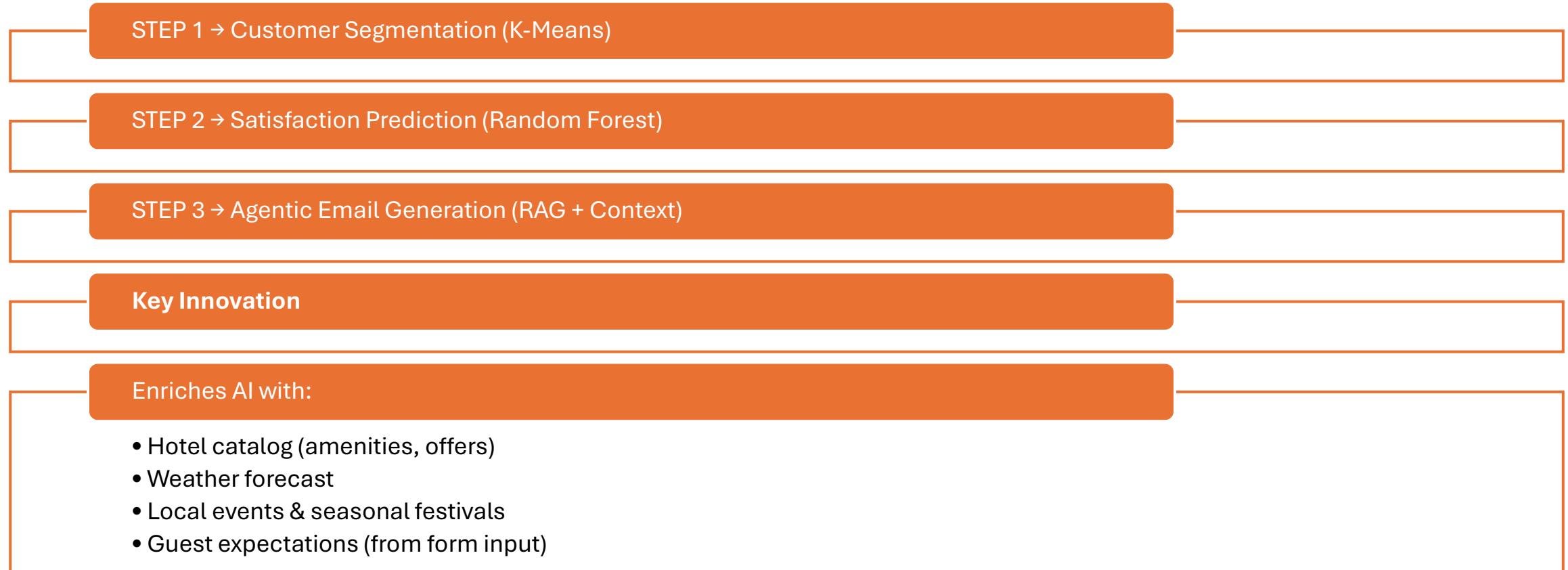
RECOMMEND EXPERIENCES BASED ON WEATHER, EVENTS, HOTEL OFFERS
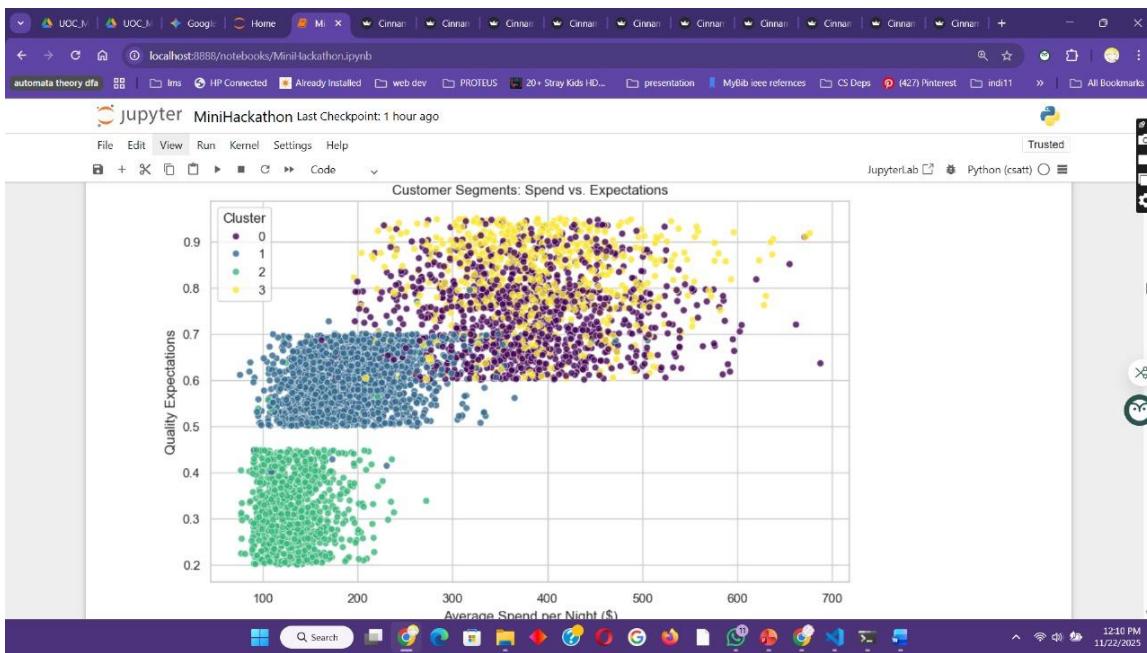
PROACTIVE INTERVENTIONS → HIGHER SATISFACTION

Pipeline

STEP 1 → Customer Segmentation (K-Means)

STEP 2 → Satisfaction Prediction (Random Forest)

STEP 3 → Agentic Email Generation (RAG + Context)

Key Innovation

Enriches AI with:

- Hotel catalog (amenities, offers)
- Weather forecast
- Local events & seasonal festivals
- Guest expectations (from form input)

Customer Segmentation

- **Unsupervised K-Means Clustering**

- **Input Features:**

- Psychographic traits (quality expectations, price sensitivity)

- Behavioral traits (spend per night, loyalty tier, travel frequency)

Segment	Traits	Intervention Strategy
At-Risk VIP	High expectations	Priority upgrades, attention
Happy VIP	Loyal, premium	Exclusive premium experiences
Budget Explorer	Value-focused	Local experiences, free perks
Standard Guest	Moderate	Convenience & comfort

Prediction Model

Random Forest Classifier

Training on:

Historical bookings

Guest demographics

Psychographics

Post-stay ratings

Results

92%+ accuracy

Top predictive features:
- Quality expectations
- Spend level
- Loyalty tier
- Booking lead time

Agentic Workflow

- **RAG-Powered Autonomous Email Agent**

- **Context Sources Automatically Retrieved:**

- Hotel features: rooms, spa, offers

- Weather forecast for stay dates

- Local events matched to location + dates

- User expectations ("Spa relaxation", etc.)

- Booking → Segment → Retrieve Context → Generate Personalized Email

- **Personalization Logic**

- VIP tone vs Budget tone

- Recommends amenities matching guest profile

- Inserts weather & event info

- Tailors offers to maximize upsell

Live Demo Flow

Technical Highlights

- **Machine Learning**
- K-Means (segmentation)
- Random Forest (prediction)
- Robust feature engineering
- Psychographic encoding
- **Agentic AI**
- RAG architecture
- Multi-source context retrieval
- Segment-aware prompts
- Streamlit UI for real-time demo
- **Tech Stack**
- Python + Scikit-learn
- Pandas + NumPy
- Streamlit
- Matplotlib

Business Impact

- **Key Outcomes**
- **Higher Guest Satisfaction**
- Personalized experiences before arrival
- Fewer negative surprises
- **Revenue Growth**
- Upsell opportunities → spa packages, upgrades
- Increased loyalty retention
- **Operational Efficiency**
- Auto-generated emails reduce staff load
- Standardized high-quality communication

Future

- **Live Integrations**
- Real weather API
- Event APIs
- Hotel PMS integration

- **Advanced Features**
- Multi-language emails
- Real-time sentiment during stay
- A/B testing for email optimization

- **Platform Expansion**
- In-stay notifications
- Concierge agent
- Mobile app alerts