The Dynamic Pricing and Human Resource Analysis for a Guest House

A Proposal report for the BDM capstone Project

Submitted by

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Declaration Statement

I am working on a Project titled "**Guest House Performance Optimization: Dynamic Pricing Models and Human Resource Analysis**". I extend my appreciation to **Garjiya Homestay**, for providing the necessary resources that enabled me to conduct my project.

I hereby assert that the data presented and assessed in this project report is genuine and precise to the utmost extent of my knowledge and capabilities. The data has been gathered from primary sources and carefully analyzed to assure its reliability.

Additionally, I affirm that all procedures employed for the purpose of data collection and analysis have been duly explained in this report. The outcomes and inferences derived from the data are an accurate depiction of the findings acquired through thorough analytical procedures.

I am dedicated to adhering to the principles of academic honesty and integrity, and I am receptive to any additional examination or validation of the data contained in this project report.

I understand that the execution of this project is intended for individual completion and is not to be undertaken collectively. I thus affirm that I am not engaged in any form of collaboration with other individuals, and that all the work undertaken has been solely conducted by me. In the event that plagiarism is detected in the report at any stage of the project's completion, I am fully aware and prepared to accept disciplinary measures imposed by the relevant authority.

I understand that all recommendations made in this project report are within the context of the academic project taken up towards course fulfillment in the BS Degree Program offered by IIT Madras. The institution does not endorse any of the claims or comments.

Signature of Candidate:

Name: Rahul Pathak

Date: June 12, 2025

1 Executive Summary

Garjiya Homestay is a small, family-run guest house located near Jim Corbett National Park in Ramnagar, Uttarakhand. It operates with six rooms and a three-person staff, offering accommodation services to domestic tourists.

The major business issues faced by the homestay are inconsistent revenue due to seasonal tourist flow and a lack of data driven dynamic pricing, along with high employee turnover that disrupts service quality. These problems lead to reduced profitability and poor guest experiences, especially during off-seasons and staff transition periods.

The project aims to address these challenges by analyzing booking, occupancy, and operational data. Various analytical approaches like descriptive analysis, trend identification, and case comparisons will be used to understand the seasonal behaviour of customers and staff patterns. Structured interviews and qualitative insights will also be incorporated to support findings.

The expected outcome is a data driven dynamic pricing strategy that aligns with seasonal demand and HR recommendations to improve staff retention. This would help the organization increase room occupancy, maintain consistent service quality, and ultimately improve profitability and sustainability in the long run.

2 Organisation Background

The business I am working with is **Garjiya Homestay**, a small-scale, family-run hospitality service located near Jim Corbett National Park at Ranikhet Road, Lakhanpur, Ramnagar, Uttarakhand. Established in 2022 by **Mr. Gautam Rawat**, the homestay primarily caters to domestic tourists visiting the national park and nearby attractions.

Operating with just **six rooms** and a lean team of **three staff members**, the business provides essential amenities such as Wi-Fi, pre-ordered meals (only for groups), and parking. It functions on a **seasonal B2C model**, with peak activity during tourist seasons and significantly lower occupancy in the off-season.

Despite its potential due to its location, Garjiya Homestay faces operational and financial challenges caused by the lack of a data driven dynamic pricing strategy and frequent staff

turnover. The organization is currently seeking ways to streamline its pricing, improve guest service consistency, and strengthen its staffing practices.

3 Problem Statement

3.1 Garjiya Homestay suffers from inconsistent revenue due to the absence of a data driven dynamic pricing model, leading to underpricing during peak seasons and low occupancy in off-seasons.

3.2 The business experiences high employee turnover within a three-person team, which disrupts daily operations and negatively impacts customer service and guest satisfaction.

4 Background of the Problem

Garjiya Homestay, though located near the tourist hotspot Jim Corbett National Park, faces significant operational challenges that restrict its growth and profitability. The first major issue is the absence of a data driven dynamic pricing system. The pricing fluctuates due to seasonal demand fluctuations but the lack of a data-based pricing model leads to inefficient pricing structure resulting in a loss of revenue maximizing capacity in season and off season. The inability to adjust prices based on demand, local events, or market competition causes inefficient resource utilization.

The second problem stems from the high rate of employee turnover. The guest house operates with a minimal staff of three, but due to lack of long-term job incentives, career growth opportunities, or proper staff management systems, employees frequently leave. This results in inconsistent service quality, poor customer experiences, and operational disruptions.

Internal factors include poor HR practices, absence of staff retention policies, and lack of tech adoption for pricing decisions. External factors involve seasonality of tourism in the region, competition from other local accommodations, and changing customer expectations. Together, these issues contribute to a cycle of low profitability and limited business stability, which this study aims to analyze and address using data-driven solutions.

5 Problem Solving Approach

5.1 Details about the methods used:

Since the problems encountered by Garjiya Homestay are of a complex nature, a combination of qualitative and quantitative methods will be employed to get a holistic understanding.

Quantitative Methods:

- **Time Series Analysis:** As booking volumes and revenues fluctuate seasonally, time-series analysis will determine demand patterns by month and year. This is vital for creating a data driven dynamic pricing policy that responds to peak and off-peak tourist seasons.
- **Predictive Pricing Model:** This model will be used to maximize total revenue by adjusting room prices based on demand prediction, occupancy patterns, and seasonality trends using data.

Qualitative Methods:

- **Staff Interviews and Observation:** To appreciate the underlying causes to appreciate the underlying causes of employee dissatisfaction, interviews and unofficial chats will be held. Discussion will revolve around work hours, wages, work satisfaction, and management styles.
- **Benchmarking:** Comparisons with comparable guest houses in Ramnagar or the surrounding areas will be conducted to find out best practices in staff retention and pricing.

5.2 Details about the intended data collection with Justification:

Operational and Financial Data:

- **Booking Records (Date, Price, Occupancy %):** Needed to assess peak/off-season demand, revenue variation, and current pricing effectiveness.
- **Room Type and Rate Data:** Helps in developing tiered pricing models based on amenities and demand.
- **Revenue and Expense Reports:** To compute profit margins and assess the financial impact of seasonal variation.

Staff Data:

- **Employee Records (Tenure, Role, Wages):** Helps identify turnover patterns and roles most affected.

- **Exit Feedback:** Provides insight into reasons for staff leaving the job.

Justification: Gathering historical booking and rate data to determine trends and create accurate pricing projections is critical. Staff-related data complements the qualitative insights and supports the formulation of actionable recommendations for HR policy improvements. Together, these datasets directly correlate with the root causes of the identified problems.

5.3 Analysis Tools and Justification:

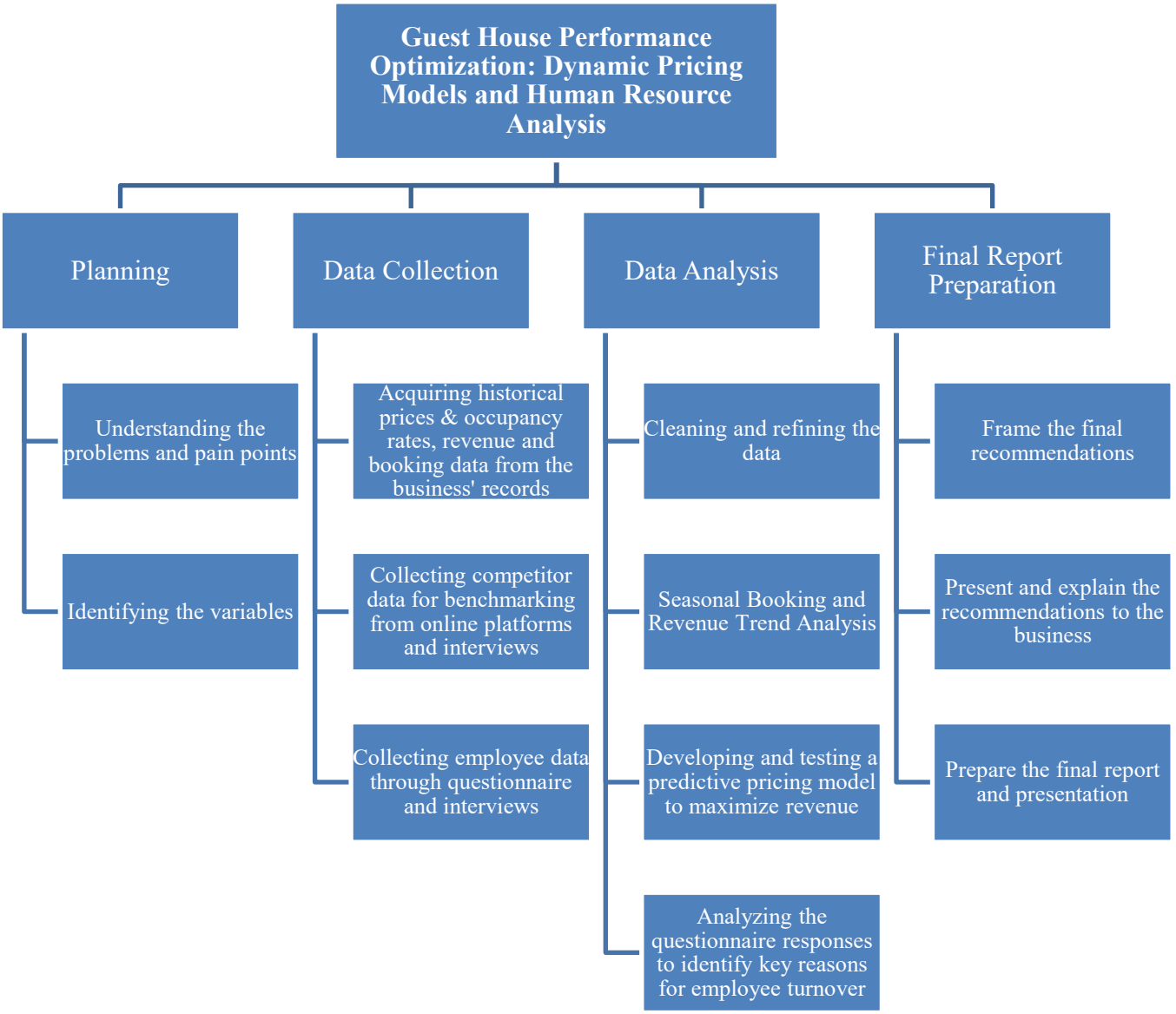
Google Sheets and Microsoft Excel: Ideal for structuring, cleaning, and conducting initial data analysis. It is simple to use for performing calculations, creating pivot tables, and graphing occupancy and revenue trends.

Python (Pandas, NumPy, Matplotlib): Best suited for advanced data analysis, including predictive models, time-series forecasting, and employee trend mapping. Python offers automation, improved scalability, and deeper analytical insights.

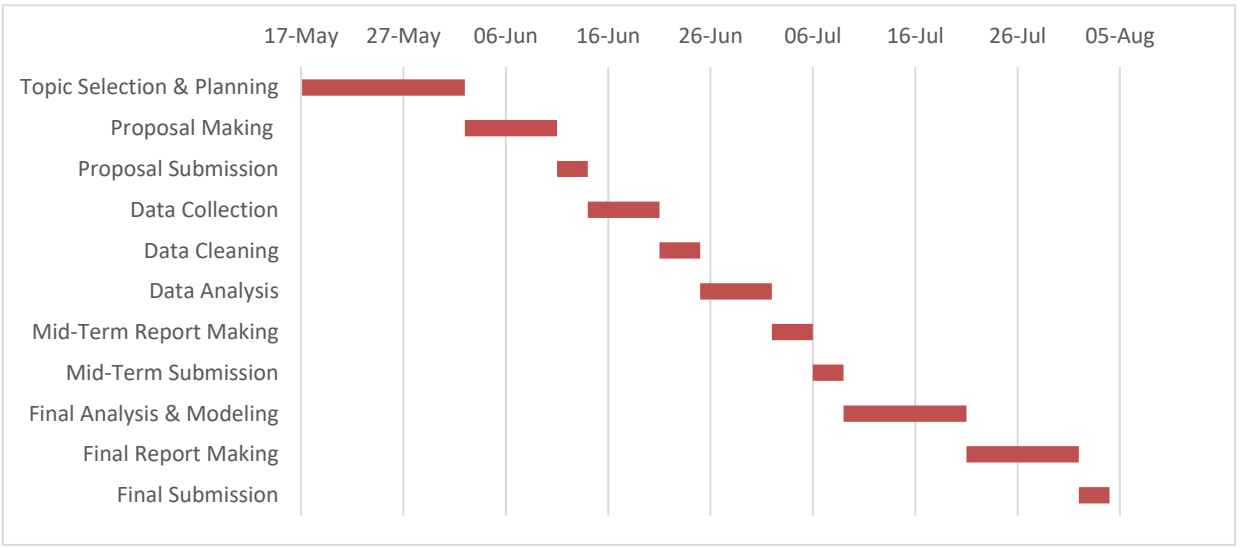
Justification: While Excel is effective for working with small datasets and generating quick visualizations, Python is preferred for its superior performance in handling seasonal data, generating pricing recommendations, and developing data models suitable for long-term planning.

6 Expected Timeline

6.1 Work Breakdown Structure:



6.2 Gantt Chart:



7 Expected Outcome

The expected outcomes of this study aim to provide **Garjiya Homestay** with actionable insights that directly address its operational and financial challenges.

7.1 Optimized Pricing Strategy:

By analyzing seasonal booking trends and occupancy rates, the project will help develop a **data driven dynamic pricing model**. This will enable the homestay to increase room prices during peak seasons and offer strategic discounts during off-seasons, thereby improving overall revenue and occupancy efficiency.

7.2 Improved Staff Retention:

Insights gathered from employee interviews and data on turnover will guide the design of a **staff retention framework**. This may include offering incentives, improving work conditions, and formalizing roles to enhance job satisfaction and reduce disruption from frequent staff changes.

7.3 Data-Driven Operational Planning:

The study will also enable the owner to make informed, data-backed decisions about room management, staffing schedules, and financial planning based on real trends rather than intuition.

Ultimately, the project will help Garjiya Homestay achieve **better service consistency, increased profitability**, and a more sustainable operational model, allowing it to compete more effectively in the local hospitality market.