Optimizing Inventory Management and Asset Utilization for a Rental Business

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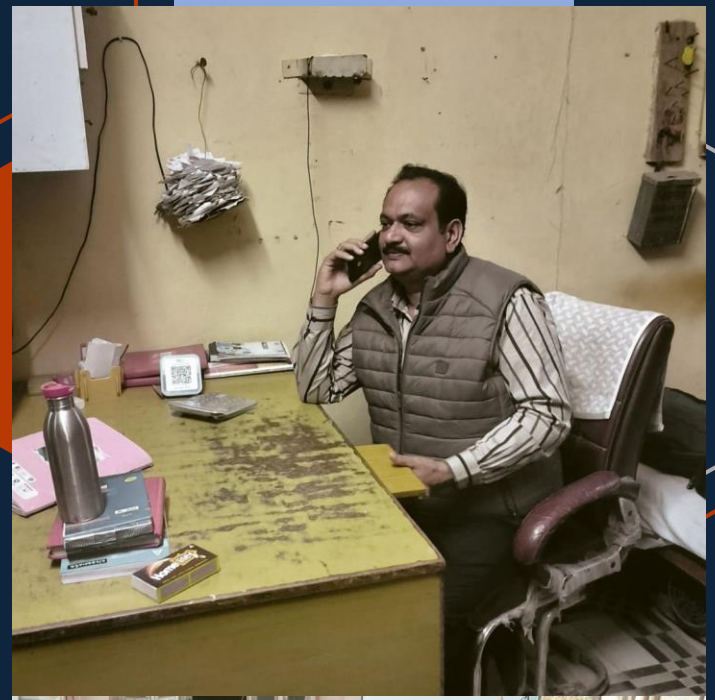
Project Overview

Business Profile:
Gupta Building Material is a construction equipment rental company owned by Mr. Sanjeev kumar . which opened its doors in 2006 based in Hanumangarh, Rajasthan, serving local construction projects.

Key Challenge:
1:- Inefficient Inventory Management
2:- Poor Asset Utilization
This leads to significant capital being tied up in underutilized stock, negatively impacting the company's profitability and cash flow.



Data Collection & Preprocessing

- **Data Sourcing:** All data was physically collected from a transaction register that was maintained by the business owner. The dataset covers all rental activities for the period of **October 1 to November 30**
- **Data Preprocessing:** The raw digital data underwent significant cleaning and preprocessing to handle inconsistencies and standardize entries. Like Rental items mismatch
- **Feature Engineering**: To enable a deeper analysis, two critical new features were engineered from the original data. Rental Duration **(No. of Days)**: This was calculated for each transaction by finding the difference between the return date and the rental date. Total Cost (INR)

The Volume vs. Revenue Disconnect

- **High Volume Leader:** The 'Phati' category is the most frequently rented item, making up over half of all rentals (**51.26%** of total quantity).
- **High Revenue Leader:** In contrast, the 'Gadar' category is the top revenue earner, generating **34.45%** of the total income despite lower rental volumes.
- **Core Disconnect:** This reveals a fundamental insight: the business's most frequent activity (renting 'Phati') is not its main driver of profitability. The company's financial health depends more on the less frequent, but more lucrative, 'Gadar' rentals.

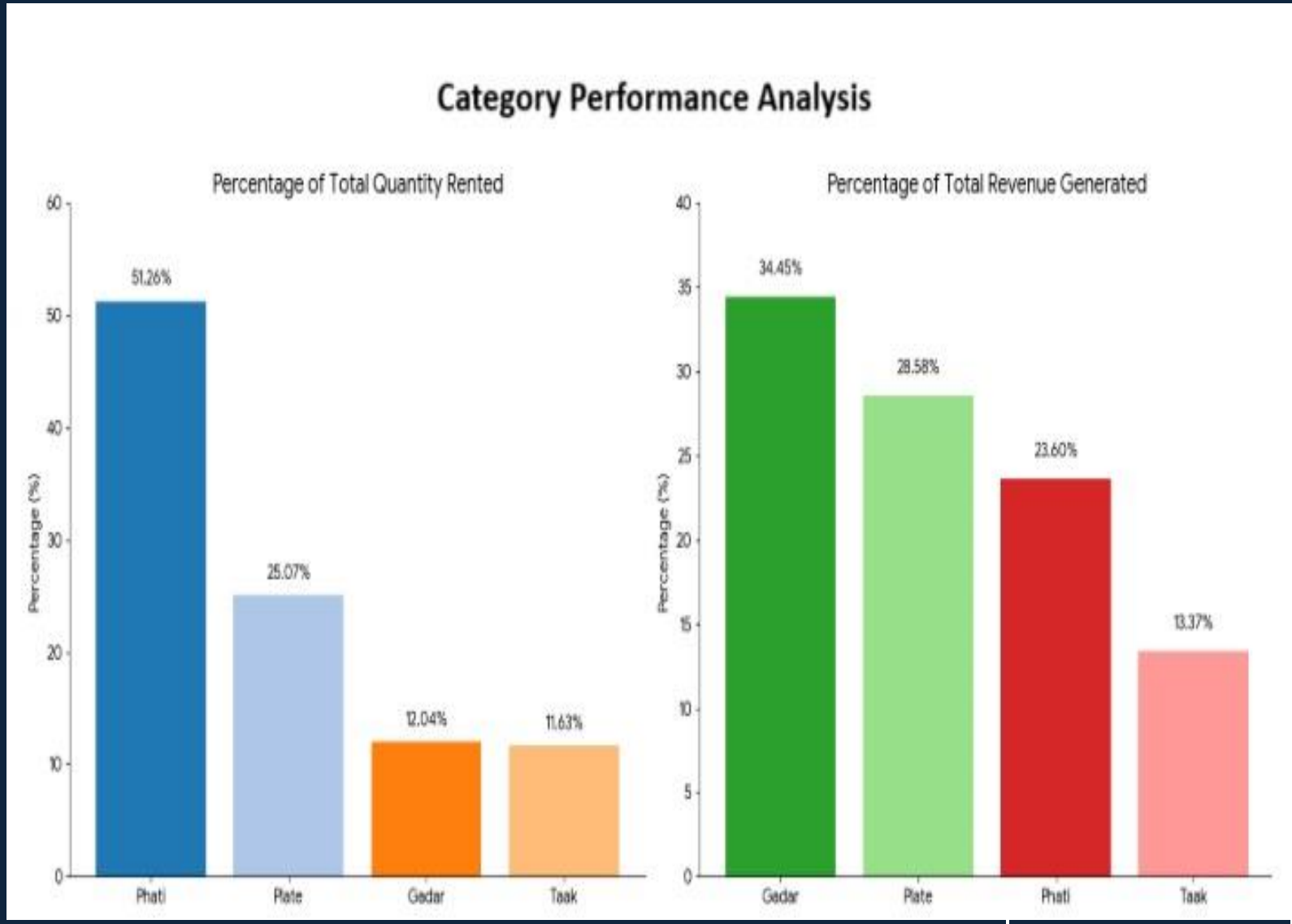


Figure 1 : Category performance Analysis

The Profitability Paradox (RoNAC)

- **Exceptional Performer:** 'Phati' is the most financially efficient asset, delivering an extraordinary **Return on Net Asset Cost (RoNAC) of 126.5%**. Its high return is driven by its extremely low net cost, making it a low-risk, high-return asset.
- **The "Capital Trap":** In stark contrast, 'Plate' is a significant financial liability. It provides a meager **6.5% return**, consuming a large amount of capital for a poor return.
- **The Paradox:** This analysis proves that focusing on revenue alone is a flawed strategy. The highest revenue-generating asset, 'Gadar', provides a much lower RoNAC of only **19.1%**, demonstrating that the most profitable assets are not necessarily the ones that bring in the most income.

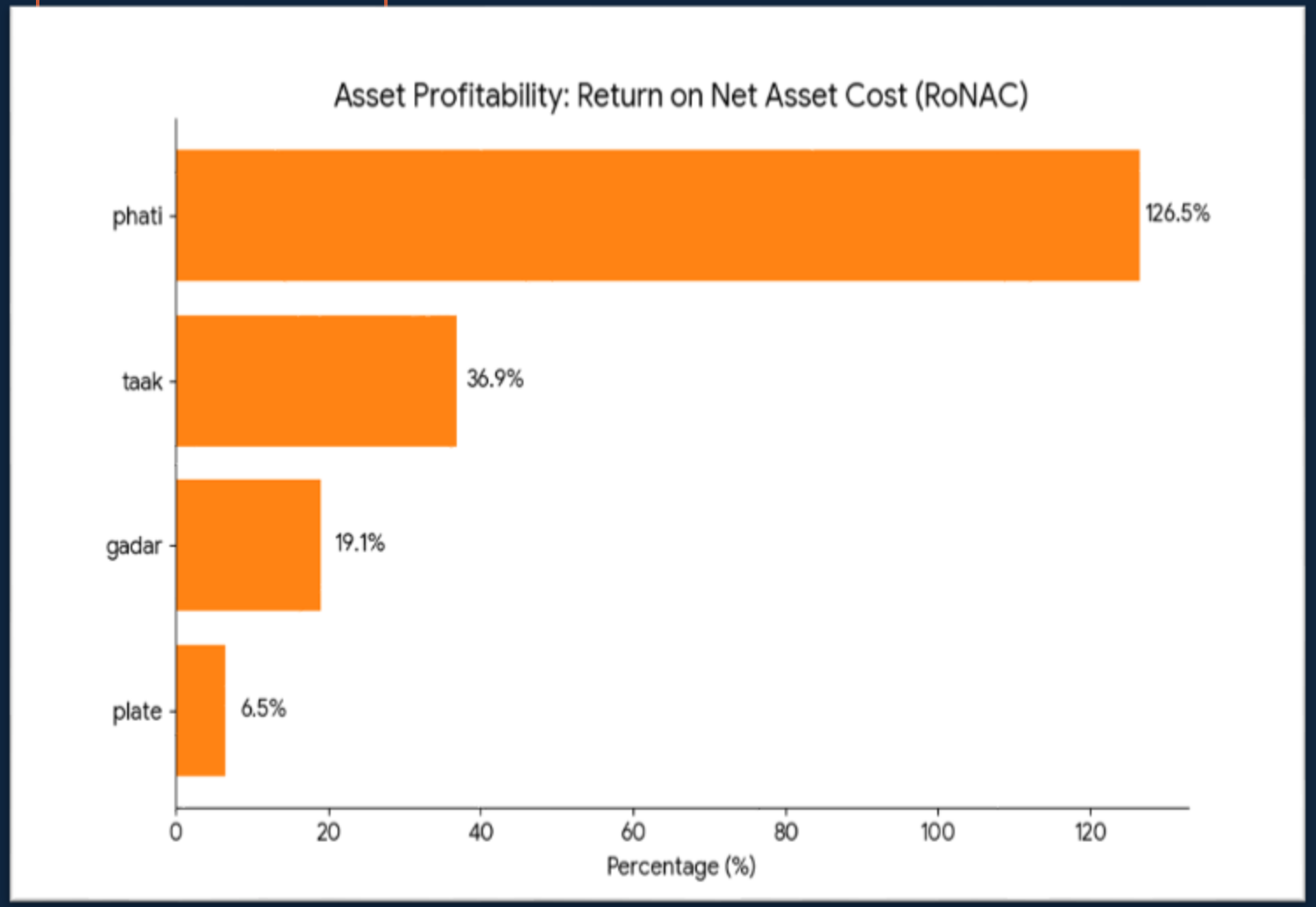


Figure 2: Asset Profitability

The Underutilization Crisis

- **Critically Low Utilization:** The most alarming finding is the extremely low asset utilization across all categories, with no equipment being used more than **5%** of the time.
- **Best and Worst Performers:** Even the most-utilized asset, 'Gadar', is only in use **4.88%** of the time. 'Plate' is the least used, with a dismal utilization rate of just **1.12%**.
- **Proof of Over-Stocking:** This data provides indisputable, quantitative evidence of a severe over-stocking of inventory relative to the current demand. It's a fundamental flaw in the inventory strategy that directly suppresses profitability and cash flow.

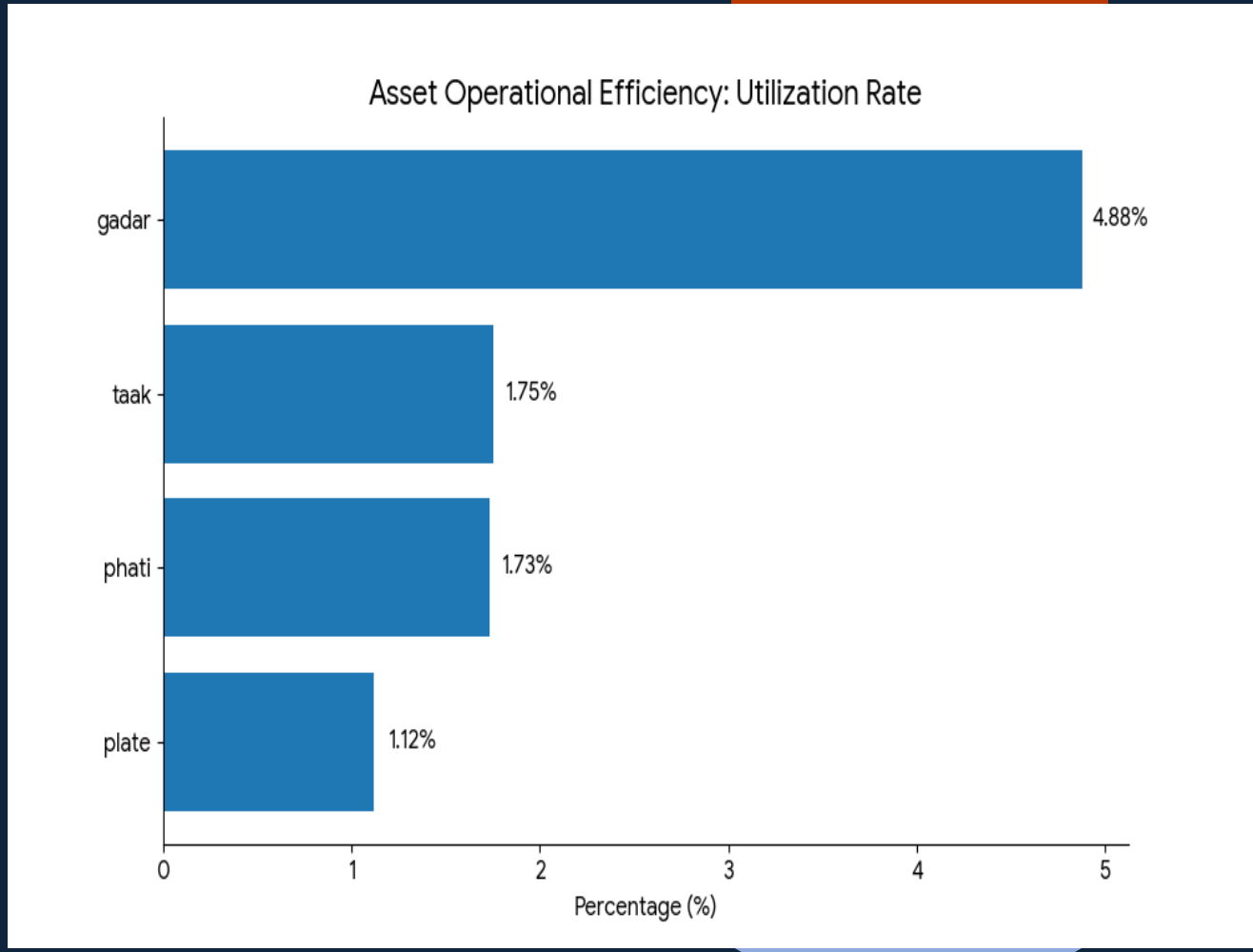


Figure 3: Asset Oeprational Efficiency

Extreme Customer Concentration

- **Critical Dependency:** The business is critically dependent on a small group of high-value clients. Just
- **7 customers** in "Category A" contribute a massive 76.80% of the company's total revenue.
- **Major Strategic Risk:** This extreme concentration creates a significant strategic risk for the business. The potential departure of even one or two of these key clients would severely impact the company's financial stability
- 'Category B' (15.70%) and 'Category C' (7.50%).

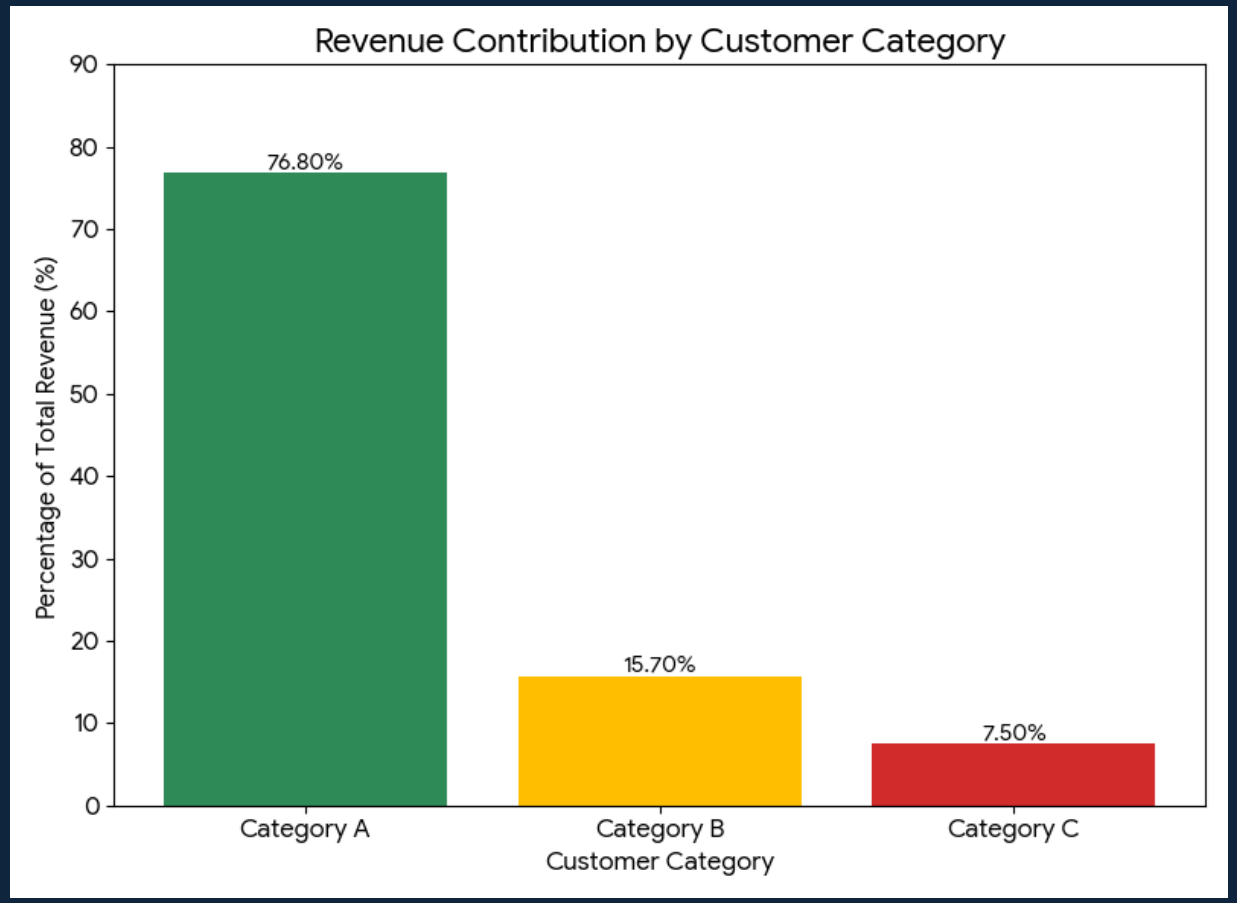


Figure 4: Revenue Contribution by Customer Category

A 4-Pronged Approach

1. **Optimize Inventory with a "Prune & Grow" Strategy:** Systematically reallocate capital by pruning the inventory of the worst-performing asset, 'Plate' (which has a 6.5% RoNAC). Simultaneously, grow the inventory of 'Gadar', which is the proven high-revenue and high-utilization asset.
2. **Implement a Dynamic Pricing Model:** Introduce a dynamic pricing strategy to better align price with demand and asset availability. This includes offering promotional discounts for idle assets to incentivize longer-term rentals and applying a premium surcharge for high-demand assets during peak periods.
3. **Develop a CRM Program:** Mitigate the risk of customer concentration by developing a formal CRM program. The primary goal is to increase the retention and loyalty of the seven key "Category A" clients through dedicated benefits and service.
4. **Introduce a Data-Driven Maintenance Schedule:** Shift from a reactive to a proactive maintenance schedule based on actual equipment usage (`Total Rented Days`). This will reduce unexpected downtime and extend the productive lifespan of the most in-demand assets.

Conclusion & Expected Outcomes

Conclusion The analysis of Gupta Building Material's data revealed a series of interconnected challenges, including a disconnect between rental volume and value, inefficient capital allocation, and significant customer-related risks. This project has provided a clear, data-driven roadmap with action able solutions designed to directly address these core problems and guide the company toward sustainable growth.

1. **Expected Outcomes** The implementation of the proposed strategies is expected to lead to several key improvements:
2. **Improved Capital Efficiency & Higher Profitability:** Reallocating capital from under performing assets to high-return ones will directly improve the company's financial performance.
3. **Increased Asset Utilization & Revenue:** Dynamic pricing will help generate incremental revenue from idle stock and maximize earnings from popular items.
4. **Reduced Strategic Risk & Business Resilience:** A formal CRM program will help retain key clients and diversify the customer base, making the business more resilient to market changes.
5. **Enhanced Operational Reliability:** A data-driven maintenance schedule will reduce unexpected equipment downtime and improve customer satisfaction.

Thank you

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