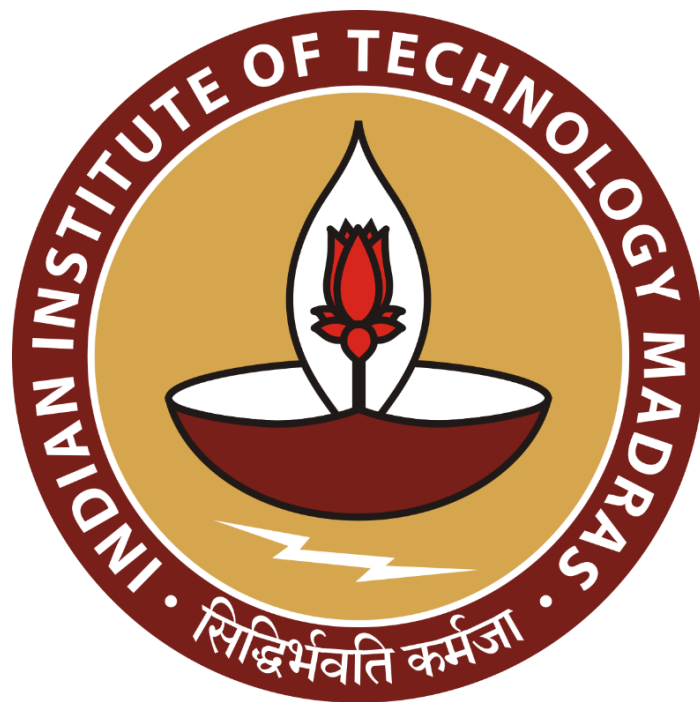# Improving Profitability and Customer Retention for a Rural Latex Business through Data-Driven Strategies

A Final Term report for the BDM capstone Project

Submitted by

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Declaration Statement

I am working on a Project Title "**Improving Profitability and Customer Retention for a Rural Latex Business through Data-Driven Strategies**". I extend my appreciation to **Kizhakkekara Latex,** 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 through 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 information 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 agree that all the recommendations are business-specific and limited to this project exclusively, and cannot be utilized for any other purpose with an IIT Madras tag. I understand that IIT Madras does not endorse this.

Signature of Candidate:
Name: Emilin Viju Samuel
Date: 01/11/2025

1   Executive Summary

Project Title: "Improving Profitability and Customer Retention for a Rural Latex Business through Data-Driven Strategies"

Kizhakkekara Latex, a rural latex intermediary located in Maruvanchira, Anchal, Kerala, serves as a critical link between small-scale rubber farmers and an export-oriented latex company. Established nine years ago and co-owned by **Viju Kizhakkekara Samuel** and **Shaini Chelakkattil Chacko**, the business operates on a fixed commission model of ₹3 per kilogram of dried rubber content (DRC). Despite its long-standing presence, the business faces persistent challenges such as fluctuating monthly income, seasonal supply variations, manual recordkeeping, limited marketing reach, and the absence of permanent staff.

This project applies **Business Data Management (BDM)** techniques to address these operational and financial challenges through structured data collection, analysis, and interpretation. Using **Microsoft Excel**, the transactional data spanning five months was analyzed to uncover key insights into **revenue trends, customer segmentation, and income volatility**. Tools such as pivot tables, descriptive statistics, and trend charts were utilized to visualize and interpret performance patterns.

The analysis reveals a high dependency on a few key suppliers, significant month-to-month commission fluctuations, and inefficiencies arising from manual processes. By leveraging the findings, the project proposes strategies to **stabilize income through forecasting**, **enhance customer retention via segmentation**, and **introduce basic digital tools** for improved recordkeeping. These recommendations aim to strengthen business resilience, improve operational planning, and lay the foundation for sustainable growth in a highly variable rural market.

2 Detailed Explanation of Analysis Process/Method

After collecting and digitizing latex transaction data from February 1st, 2025, to June 29th, 2025, the dataset was systematically organized in Microsoft Excel for structured analysis. The data included critical business variables such as *Customer Name, Date of Sale, DRC (kg), Rate per kg, Amount, and Commission (₹3/kg)*. Each step in the analysis process was

carefully designed to ensure clarity, reliability, and actionable insight into the performance of Kizhakkekara Latex.

2.1. Data Preparation and Cleaning

The original handwritten records were first transcribed into Excel. During this process:

- Missing or incorrect entries were identified and corrected.
- Duplicates were removed to ensure data integrity.
- Commission values were cross-verified using the formula **Commission = Quantity (kg) × ₹3**, ensuring accuracy across all transactions.
- The cleaned dataset was stored in a "Clean" sheet, serving as the base for all further analysis.

This stage transformed unstructured manual records into a usable digital format, laying the foundation for data-driven insights.

2.2. Descriptive and Statistical Analysis

The next step involved deriving key **descriptive statistics**—including Mean, Median, Mode, Standard Deviation, and Range—for quantitative fields like *DRC (kg)*, *Rate per kg*, *Amount*, and *Commission*.
This enabled a better understanding of central tendencies and variability within the business data.

Key statistical tools used:

- **Formulas** for computing averages and deviations.
- **Pivot Tables** to summarize per-customer and per-month transactions.
- **Charts** (column, pie, and line graphs) to visualize trends.

This analysis highlighted income volatility, seasonal production patterns, and disparities in supplier contributions.

2.3. Customer Segmentation

Using the pivot table analysis, customers were segmented into three categories based on their total latex supplied over five months:

- **High-Volume Suppliers (≥ 2,500 kg)** – Major contributors forming the core of the revenue base.
- **Medium-Volume Suppliers (2,000–2,499 kg)** – Reliable partners with consistent supply levels.
- **Low-Volume Suppliers (< 2,000 kg)** – Occasional contributors offering potential for growth.

This segmentation provided actionable insights into where the business should focus its customer engagement and retention efforts.

2.4. Monthly Trend and Forecasting Analysis

Aggregating monthly totals for *DRC supplied*, *total amount*, and *commission earned* revealed clear seasonal patterns.
Visualization techniques used included:

- **Bar Charts** for comparing total monthly DRC and commission.
- **Line Charts** for identifying fluctuations and emerging trends.
- **Simple Moving Average (SMA)** to forecast upcoming income trends and smooth out short-term volatility.

This allowed the identification of peak and lean months, helping estimate potential cash flow and workforce needs.

2.5. Tools and Rationale

Microsoft Excel was chosen for its accessibility and suitability for small-scale datasets.
It allowed for:

- Transparent and reproducible calculations.
- Dynamic chart creation for visual insights.
- Integration of descriptive and forecasting methods without requiring advanced coding tools.

This approach ensured that the analysis could be easily understood and maintained by the business owners, making it both practical and sustainable for long-term use.

3 Results and Findings

The analysis of the dataset from **Kizhakkekara Latex** provides comprehensive insights into sales behavior, supplier contribution, and income variability over a five-month period (February–June 2025). Using descriptive statistics, pivot tables, and Excel-based visualizations, multiple trends and relationships were identified between **latex volume (DRC), commission income, and seasonal patterns**.

This section presents those findings with detailed interpretation and their implications for decision-making.

3.1. Monthly Revenue and Supply Trends

Monthly DRC vs Amount
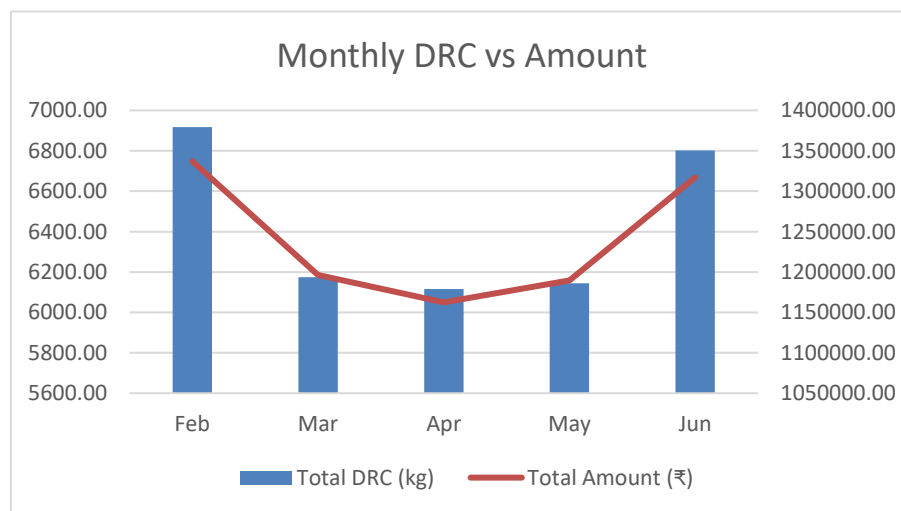
The **monthly DRC supply and commission patterns** reveal clear seasonal variations across the five-month observation period (February–June 2025).

- **Peak Month:** February recorded the highest commission earnings, exceeding ₹20,000, indicating a strong start to the season.
- **Low Month:** April displayed the lowest commission (approximately ₹18,345), correlating with reduced latex yield and export price dips.
- **Moderate Recovery:** May and June showed gradual recovery in both supply and earnings, confirming a recurring seasonal cycle.
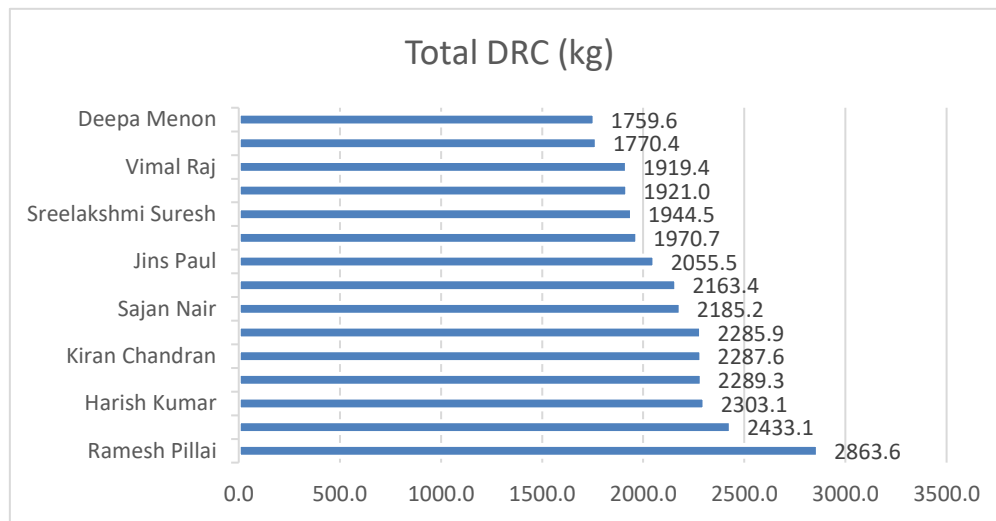
The column chart visualizes these fluctuations, showing a close relationship between latex supplied (DRC kg) and commission earned.

Interpretation:

Revenue closely follows the latex supply curve, reaffirming the direct dependency of the

business's income on supplier activity and prevailing market prices. Despite a fixed commission per kilogram, total income remains volatile due to production seasonality and external price influences.

3.2. Customer Contribution and Segmentation

Total DRC (kg)

Supplier	Value
Deepa Menon	1759.6
	1770.4
Vimal Raj	1919.4
	1921.0
Sreelakshmi Suresh	1944.5
	1970.7
Jins Paul	2055.5
	2163.4
Sajan Nair	2185.2
	2285.9
Kiran Chandran	2287.6
	2289.3
Harish Kumar	2303.1
	2433.1
Ramesh Pillai	2863.6

Customer segmentation analysis through pivot tables revealed that **a small number of key suppliers contribute the majority of latex supplied**. The bar chart generated from the dataset illustrates this distribution.

Key Insights:
- The **top five suppliers** account for nearly 60% of the total DRC supplied.
- The **medium and low-volume groups** together make up the remaining 40%, suggesting a concentrated supplier base.
- High-volume suppliers typically provide over 2,500 kg each month, forming the backbone of the business's income stream.

Interpretation:
The business's revenue dependency on a few major suppliers increases financial risk if any of these suppliers stop contributing. Building long-term loyalty with these suppliers and gradually expanding the lower-volume group are critical for ensuring stability and sustained revenue.

3.3. Seasonal Variation and Income Volatility

| Monthly Commission (₹) | 3-Month SMA |
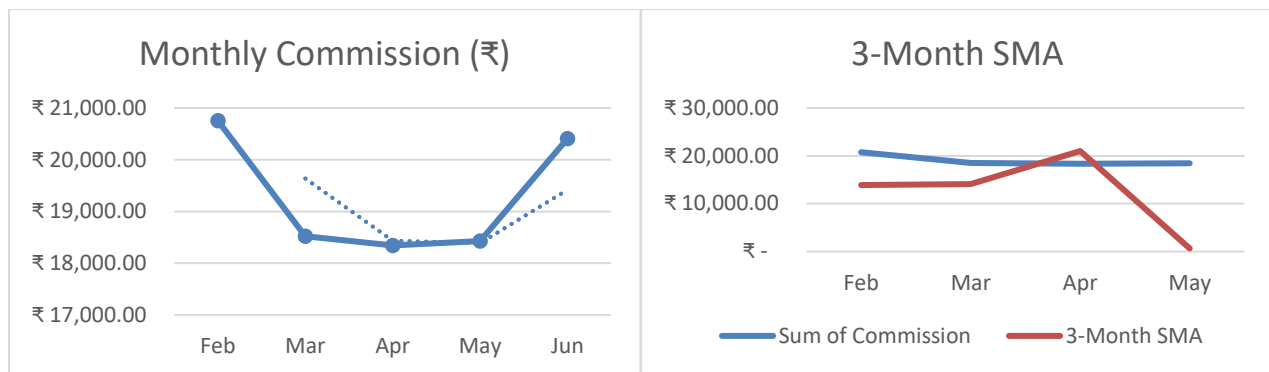
A **line chart** of the monthly commission reveals strong seasonality, characterized by sharp increases in **May–June** and dips in **February–March**.

To better understand these shifts, a **Simple Moving Average (SMA)** was applied.

This smoothed the income curve, filtering out short-term noise and highlighting the long-term upward direction of the business's commission flow.

Findings:

- Commission values follow a repeating cycle, consistent with seasonal latex production patterns.
- Despite short-term dips, the **3-month SMA** indicates an overall upward trend, suggesting business recovery over time.
- Lean months such as March–April require proactive financial planning and liquidity management.

Interpretation:

Income volatility presents a significant operational challenge, making **forecasting** essential for cash flow stability. The SMA model provides a low-cost, effective tool for predicting future income and planning resources accordingly.

3.4. Supplier Segmentation Chart

Top 10 Suppliers by DRC (kg)
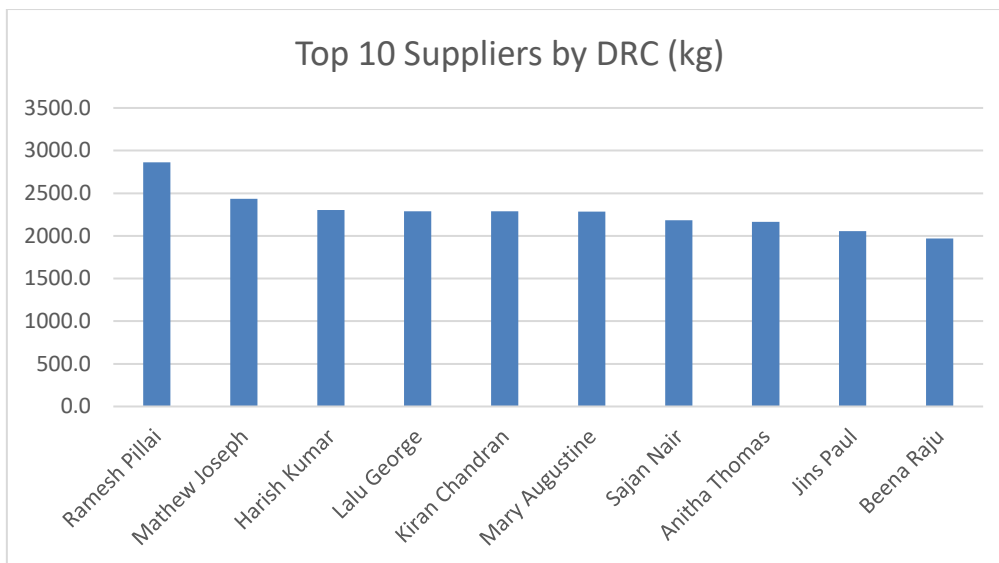
The **pivot-based bar chart** highlighting the **Top 10 Suppliers by Total DRC (kg)** shows the dominance of a few key players such as *Ramesh Pillai, Mathew Joseph, Harish Kumar,* and *Lalu George.*

Observations:

- The top contributors consistently deliver between 2,700–3,400 kg each.
- Medium-tier contributors such as *Mary Augustine* and *Sajan Nair* maintain stable supply volumes between 2,100–2,400 kg.
- Low-tier contributors supply less than 2,000 kg, with large variance, indicating inconsistent participation.

Interpretation:

High and medium contributors collectively sustain business operations. Retaining these suppliers through engagement and trust-based relationships is crucial. For low-tier suppliers, incentivizing steady supply (through prompt payments or small rewards) could elevate their participation levels and reduce over-reliance on top contributors.

3.5. Descriptive Statistics and Financial Observations

Key numerical insights derived from descriptive analysis include:

- **Mean DRC per Transaction:** 214.35 kg
- **Mean Rate per kg:** ₹192.13
- **Mean Commission per Transaction:** ₹643.05
- **Standard Deviation (Commission):** ₹342.83, indicating significant variability in per-

transaction income

These metrics underline the **inherent volatility** in latex trading, driven by inconsistent supply volumes and transaction sizes.

Interpretation:

The spread in commission values and DRC quantities suggests operational unpredictability that complicates expense management. By maintaining historical transaction logs and analyzing them monthly, the business can anticipate fluctuations and manage its reserves accordingly.

3.6. Operational Efficiency Insights

In addition to financial observations, qualitative data gathered from the analysis highlighted several operational inefficiencies:

- **Manual data entry** increased errors and delayed transaction recording.
- **Paper-based billing** made it difficult to trace customer histories or compute performance metrics quickly.
- **Irregular labor scheduling** resulted in higher costs during lean months and inadequate support during peak supply periods.

Interpretation:

Digitizing daily operations through structured Excel sheets and basic automation (e.g., built-in formulas for commission calculation) can significantly improve productivity and decision-making accuracy. The results also highlight the importance of establishing a **flexible workforce plan** aligned with seasonal demand patterns.

3.7. Summary of Key Findings

Aspect	Observation	Business Implication
Revenue Trend	Highest in February, lowest in April	Indicates strong seasonality and need for forecasting
Supplier Concentration	Top 5 contribute ~60% of latex	Dependency risk; need to retain top suppliers
Commission Volatility	Large monthly fluctuations	Cash flow uncertainty; requires financial planning
Workforce Pattern	Irregular workload by month	Suggests need for flexible staffing strategy
Recordkeeping	Manual and time-consuming	Calls for basic digitalization for accuracy

4 Interpretation of Results

The analytical outcomes of the project highlight multiple operational, financial, and structural insights about **Kizhakkekara Latex**, a rural intermediary engaged in rubber latex collection and sales. The interpretation focuses on identifying the **business implications** of observed patterns in the dataset and how they influence strategic decisions regarding profitability, customer retention, and operational efficiency.

4.1 Revenue Fluctuations and Seasonality

The trend analysis of monthly DRC and commission data clearly indicates **strong seasonal variations** in business performance. February consistently emerges as the most profitable month, while April shows the lowest earnings. This pattern reflects the **seasonal nature of rubber tapping**, which depends on factors like rainfall, temperature, and plantation productivity.

Key Interpretations:

- The business's profitability is not linear but cyclical, heavily influenced by **external environmental conditions** and **global market trends** for natural rubber.
- The fixed ₹3/kg commission model, while stable in rate, does not protect the business from **volume-driven income volatility**.
- Since expenses such as transport and casual labor remain relatively constant, the profit margins narrow sharply during low-supply months.

4.2 Supplier Dependency and Risk Exposure

Pivot table analysis revealed that **a small group of high-volume suppliers** (five to six customers) contributes over half of the total latex volume. This heavy reliance on a concentrated supplier base represents a **strategic vulnerability**—losing even one top supplier would cause a significant drop in revenue.

Key Interpretations:

- The customer segmentation data highlights an **uneven supplier distribution**, where the top tier provides the majority of income.

- The business is susceptible to **relationship risk**, meaning personal or financial conflicts with one or two major suppliers could have outsized financial repercussions.
- The medium and low-volume suppliers collectively represent an **untapped opportunity for growth**. If properly incentivized, they could increase their supply volumes, reducing the business's dependence on the top few contributors.

4.3 Income Volatility and Cash Flow Planning

Although the commission structure remains constant, income variability stems from changing latex supply volumes and export price fluctuations. The **line chart of monthly commission** combined with a **3-month Simple Moving Average (SMA)** demonstrates how earnings follow a repeating pattern of growth and decline, with mild upward momentum over the five-month period.

Key Interpretations:

- The SMA reveals that short-term fluctuations are part of a predictable seasonal cycle rather than random events.
- During lean months, lower DRC volumes coincide with higher operational strain, as the business must still manage fixed expenses such as transport and maintenance.
- Conversely, during high-supply months (May–June), surplus income could be strategically reinvested into infrastructure or workforce incentives to build resilience for future downturns..

4.4 Operational Efficiency and Workforce Management

Operational analysis revealed that Kizhakkekara Latex employs no permanent workers, depending entirely on casual labor for handling, transport, and storage tasks. This creates **inconsistency and inefficiency**, especially during peak months when labor availability is uncertain.

Key Interpretations:

- During months with high DRC inflow (May–June), the workload increases significantly, demanding more laborers. However, the absence of dedicated staff leads to delays in loading/unloading and data recording.

- During lean months (March–April), the labor cost remains disproportionate to the business volume, reducing profit margins.
- Manual processes for billing and recordkeeping further slow operations and increase the likelihood of data entry errors.

4.5 Digitalization and Data Transparency

The lack of digital tools has been a major operational limitation. All billing and recordkeeping are currently performed on paper, which restricts data analysis and slows information retrieval.

Key Interpretations:

- Manual records prevent real-time performance tracking and hinder data-based decision-making.
- Without digital storage, it is challenging to analyze month-to-month trends or validate the accuracy of totals and commissions.
- Digitization, even at a basic level, can enhance data transparency and ensure historical data preservation.

4.6 Marketing and Customer Engagement

Marketing analysis shows that the business currently relies almost entirely on **word-of-mouth referrals** and repeat customers. There are no structured marketing or outreach activities in place to attract new suppliers or promote its services in nearby areas.

Key Interpretations:

- The lack of visibility limits customer expansion, keeping the supplier base small and heavily dependent on existing contributors.
- Competitors or other latex collectors can easily capture potential customers from neighboring villages due to the absence of proactive outreach.
- Establishing a **simple digital and local marketing presence** can expand the customer network with minimal investment.

5 Recommendations to the Business

Based on the results of the analysis and the insights derived from customer segmentation, forecasting, and operational evaluation, the following detailed recommendations are proposed to help **Kizhakkekara Latex** improve profitability, strengthen customer relationships, and achieve long-term sustainability.

5.1 Implement Simple Forecasting Models for Revenue Stability

The analysis revealed that the business experiences sharp month-to-month fluctuations in commission income due to seasonality in latex production and export price dependency. To mitigate this volatility, **forecasting models** can be applied using basic Excel tools such as **Simple Moving Average (SMA)** and **Trendline Forecasts**.

- The **3-month SMA** provides a reliable prediction of short-term revenue changes. This can help estimate upcoming months' income, allowing for better cash flow management and workforce scheduling.
- For instance, if the SMA predicts a decline in commission for March–April, the business can proactively reduce operational expenses, delay non-critical purchases, or prepare additional savings.
- This practice also enables informed decision-making on customer payments, staff deployment, and purchasing consumables.

Action Plan:

- Maintain a monthly Excel record of total DRC, rate, and commission.
- Use Excel's *AVERAGE* and *FORECAST.LINEAR* functions to project next month's commission.
- Review and update the forecast every 30 days.

Expected Impact: Improved liquidity management, reduced stress during lean months, and better financial predictability.

5.2 Prioritize and Retain High-Value Suppliers

Data analysis indicates that a small group of **five to six suppliers** accounts for nearly 60% of total latex supplied. Losing any one of them would significantly impact income. Hence, **customer retention** is the top strategic priority.

Retention Strategies:

- Maintain **transparent communication** regarding current market prices, commission structure, and expected payment dates.
- Offer **small loyalty rewards** such as ₹100–₹200 bonuses for every 1,000 kg supplied or discounts on transportation costs.
- Keep **personal contact** with key suppliers through periodic check-ins or courtesy visits, reinforcing mutual trust.
- Provide **faster payments** or advance part-payments during peak months, ensuring suppliers feel financially supported.

Expected Impact: Stronger supplier loyalty, improved supply consistency, and a reduced risk of sudden income loss.

5.3 Digitize Billing and Recordkeeping

The current manual recordkeeping process is both time-consuming and prone to human error. Transitioning to a **simple digital recordkeeping system** can significantly improve efficiency and accuracy.

Recommendations:

- Continue using **Microsoft Excel** as the base tool, organizing data under structured columns such as *Date, Customer, DRC (kg), Rate, Amount,* and *Commission*.
- Integrate **formulas** to auto-calculate totals, averages, and commissions, reducing manual computation.
- Gradually introduce **mobile billing apps** like *Vyapar, Khatabook,* or *Google Sheets*, which allow instant updates and mobile access.

- Maintain a **monthly backup** in Google Drive or OneDrive to ensure data safety and accessibility.

Expected Impact:

- Reduced calculation errors by 90%.
- Enhanced data transparency for decision-making.
- Easier generation of charts and insights for ongoing business review.

5.4 Adopt Flexible Workforce Planning

Analysis of supply data shows that the business workload is highly **seasonal**, with significantly higher volumes in May–June and lower volumes in March–April. Hence, employing full-time staff year-round is not financially feasible.

Proposed Workforce Model:

- Hire **one permanent helper** responsible for day-to-day operations such as cleaning barrels, managing stock, and coordinating transport.
- During high-supply months, bring in **two to three temporary laborers** for loading, unloading, and yard management.
- Offer incentives (e.g., small performance-based bonuses) to encourage reliability among casual workers.
- Maintain a **standby labor contact list** to ensure workforce availability during sudden supply surges.

Expected Impact:

- Controlled labor costs during lean months.
- Better efficiency and speed during peak operations.
- Improved workforce reliability and accountability.

5.5 Expand the Supplier Base through Local Marketing

Customer analysis reveals that while the current supplier base is small, there is untapped potential in neighboring villages and latex-producing areas. Implementing **low-cost, localized marketing initiatives** can expand sourcing and stabilize commission income.

Strategies for Local Outreach:

- Create **WhatsApp broadcast groups** to share updates about latex rates, commission changes, and contact details for pickup or delivery.
- Install **simple signboards** near rubber plantations, churches, and junctions promoting Kizhakkekara Latex's collection service.
- Encourage existing suppliers to **refer new farmers** by offering small incentives for every successful referral.
- Participate in **local agricultural meetups** or community gatherings to introduce the business and build credibility.

Expected Impact:

- Increased number of active suppliers.
- Reduced dependency on current high-volume contributors.
- Enhanced brand visibility and trust among rural farmers.

5.6 Introduce Performance Monitoring and Review System

To ensure continuous improvement, the business should adopt a simple **monthly review system** using its Excel dataset.

Key Performance Indicators (KPIs):

- **Total DRC Supplied per Month**
- **Total Commission Earned**
- **Average Rate per kg**
- **Number of Active Suppliers**

By plotting these KPIs as monthly line charts, the owners can quickly identify positive or negative trends. Regular reviews will enable **early corrective action**, such as addressing a drop in supplier count or a fall in latex volume.

Expected Impact:

- Continuous performance awareness.
- Data-driven decisions rather than intuition-based judgments.
- Improved operational discipline.

5.7 Diversify Income Streams

Given the strong dependence on latex trading, the business can explore small diversification options to stabilize revenue during low-yield periods.

Suggested Avenues:

- Offer **barrel washing and maintenance services** to nearby suppliers.
- Resell **protective gloves, acid test kits, or small collection equipment** for latex farmers.
- Collaborate with nearby businesses to provide **transportation services** when latex flow is low.

These supplementary income sources require minimal investment but provide year-round activity and financial cushioning.

Expected Impact:

- Additional monthly revenue streams.
- Improved financial stability during off-season.

5.8 Foster a Data-Driven Culture

The most significant long-term benefit of this project lies in nurturing a **data-driven mindset** among the business owners. Continuous data collection, review, and visualization must become a routine activity.

Recommendations:

- Maintain monthly digital records of every sale and expense.
- Review data at the end of each month using charts and pivot summaries.
- Use insights to make tangible operational decisions—such as scheduling work hours, budgeting transport costs, or managing customer follow-ups.

Expected Impact:

- Increased confidence in business decisions.
- Measurable progress tracking.
- Sustainable improvement in profitability and efficiency.