Data-Driven Optimization of Loan Performance & Customer Engagement

Vedika Micro Finance | SQL & Power BI Analysis |

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1. Executive Summary

This project aims to optimize loan collections and cross-sale strategies at **Vedika Micro Finance** using **advanced SQL analytics** and **Power BI visualizations**. The analysis provides actionable insights into branch-level performance, customer segmentation, and delinquency patterns.

2. Business Context

Vedika Micro Finance, a leading NBFC-MFI, disburses small-ticket loans and sells essential household items through cross-sales. The company operates across multiple Indian states and aims to strengthen digital, data-driven operations.

3. Project Objective

- Analyze loan repayment behavior and default patterns
- Segment customers based on risk and performance
- Evaluate cross-sale opportunities and patterns
- Recommend strategies to improve engagement and revenue

4. Dataset Overview

Table	Description
`customers`	Customer demographics
`loans`	Loan disbursement data
`payments`	Loan repayments
`cross_sales`	Product sales linked to customers
`branches`	Branch and geographic data

5. Data Model Design

- **One-to-many** relationship between:
  - Customers → Loans
  - Loans → Payments
  - Customers → Cross Sales
  - Customers → Branches (via state)
- Tables were imported to **MySQL Workbench** and linked in **Power BI**

6. SQL Analysis & Business Insights

◆ Branch Default Risk

Branches with >₹5L disbursement and >10% default rate were identified. These need improved credit appraisal.

◆ Early Payers

Customers making repayments within 5 days are potential candidates for repeat loans and cross-sales.

◆ Cross-Sale Trends

Most sales were linked to loans. Inverters and TVs were top products during disbursement periods.

◆ Inactive but Buying

Several customers with no active loans still purchased products — an upselling opportunity.

◆ Delinquency Ranking

Customers were ranked by delay in payments. Top 10 high-risk borrowers were flagged.

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7. Power BI Dashboard Summary

Interactive visuals were created:

- Loan disbursement trend by month
- State-wise and branch-wise loan volumes
- Pie chart of loan status (active, closed, defaulted)
- Cross-sale product trend analysis
- Customer segmentation by age and gender
- Overdue risk ranking

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8. Key Recommendations

1. **Target Early Payers:** Offer bundled cross-sale products
2. **Focus on High-Default Branches:** Reassess credit risk & training
3. **Track Inactive Spenders:** Launch call campaigns for new loan offers
4. **Automate Risk Alerts:** Use overdue ranks to trigger field action

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9. Learnings

- Strong SQL querying leads to deep business insights
- Joins, CTEs, and window functions unlock powerful analysis
- Power BI brings data to life and supports decision-making
- Real-life microfinance data is ideal for analytical practice

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10. Appendix

- Sample Queries (available in `03_analytics_queries.sql`)
- Entity Relationship Diagram (ERD)
- Sample Data Records

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