Streamlining project deadlines and resource allocation in a competitive construction market

This presentation investigates how a construction company can use business data management to address challenges in a competitive market. We will explore data analysis, identify key areas for improvement, and present strategic recommendations.

by ERAM NISHAT

AGENDA

Business Overview

Mohra Company Limited: History, services, and key personnel.

Problem Statement

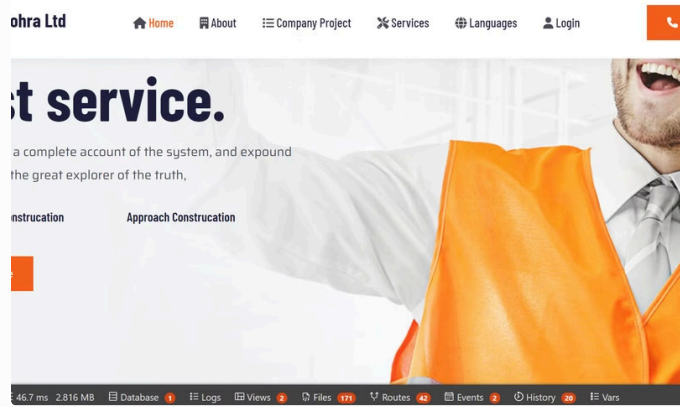Addressing project delays, intense market competition, and client retention challenges.

Data Overview

Analysis of invoice data, stakeholder interviews, and industry benchmarks.

Analysis & Recommendations

Key findings on client patterns, project durations, and profitability, with applicable recommendations.

Business Overview

Established Presence

Mohra Company Limited: 15 years in Riyadh, KSA, strong industry reputation.

3

Core Projects

Specializes in fuel stations, villas, restaurants, showrooms, and warehouses.

Dedicated Team

18 dedicated construction management professionals.

Problem Statement

Mitigate Project Delays

Analyze project data to identify common causes of delays and implement strategies to improve efficiency and minimize delays.

Fortify Client Relationships

Develop effective customer retention strategies to nurture existing client relationships, encourage repeat business, and maximize customer lifetime value.

Bolster Market Competitiveness

Identify high-value clients and develop targeted strategies to attract and retain them, leading to a stronger competitive edge in the market.

4

Made with Gamma

Raw Data and Pre-Processing

Data Collection

Gather quantitative and qualitative data from various sources, including invoices, project records, stakeholder interviews, and industry benchmarks.

Quantitative Data

Analyze numerical data, such as profit, project duration, and client information, to identify patterns and trends.

Qualitative Data

Conduct stakeholder interviews to gather insights on project management processes, client satisfaction, and market trends.

Analysis and Verification

Use Python to analyze the data and identify significant insights. Verify the findings with additional data from industry sources and internal stakeholders.

Comprehensive Collection: Access to raw and processed data, business visuals, and a sneak peek into Mohra's data preprocessing code, showcasing the foundation of the analysis.

Google Drive

Proof of Originality - Goog...

Comprehensive Data and Preprocessing Workflow: Raw...

	B	C	D	
ent Name		Invoice Date	Total Amount (SAR)	
BS NORTH CONTRACTING COM.		22-Mar-24	103,097.50 S	
dustrial Resin Factory		29-Mar-24	489,292.23 N	
· Afaq Al- Mumtada Co. Ltd.		30-Mar-24	625,416.00 (	
ena Saudi Company		03-Apr-24	20,493.00	
w Rabwa Real Estate Company		14-Apr-24	120,313.00 V	
re Makers Interiors L.L.C		12-May-24	24,150.00	
ndred Real Estate Company		04-Jun-24	60,375.00 A	
ited National Electromechanical Co		11-Jun-24	10,350.00 V	
re Makers Interiors L.L.C		04-Jul-24	20,585.00	
ited National Electromechanical Co		01-Aug-24	98,043.25 +	
· Afaq Al- Mumtada Co. Ltd.		13-Aug-24	58,500.62 N	
udi Plastic Factory Co.		24-Aug-24	87,906.00 S	
ited National Electromechanical Co		28-Aug-24	57,042.88 S	
ited National Electromechanical Co		02-Sept-24	14,921.00 +	

	C	D	
e (SAR)	No. of Orders	Total Cost (SAR)	Profit
20493	1	18033.84	2
9292.23	1	428787.54	60
0357.13	4	155210.45	25
44735	2	40677.27	4
03097.5	1	91187.61	11
3916.62	3	607190.76	91
87906	1	77152.63	10
60375	1	52500	
120313	1	103553.45	16

```python
# Group by 'Project Category' to summarize profitability and
duration
project_summary = profit_data.groupby('Project Category').agg({
    'Duration of Work (Days)': 'mean',
    'Gross Profit Margin (%)': 'mean'
}).reset_index()

# Sort by highest gross profit margin
profitable_projects = project_summary.sort_values(by='Gross Profit
Margin (%)', ascending=False).head(10)
```

Made with Gamma

Findings on Client Cluster Patterns

Cluster 0

Short-duration, cost-sensitive clients who are ideal for quick projects.

- Store Makers Interiors LLC (Commercial)

Cluster 1

Balanced, versatile clients who generate stable revenue across various project categories.

- United National Electromechanical Co (Institutional)
- Saudi Plastic Factory Co (Industrial)
- New Rabwa Real Estate Company (Residential)

Cluster 2

High-value clients with long-term, resource-intensive projects that yield substantial profits.

- Industrial Resin Factory (Industrial)
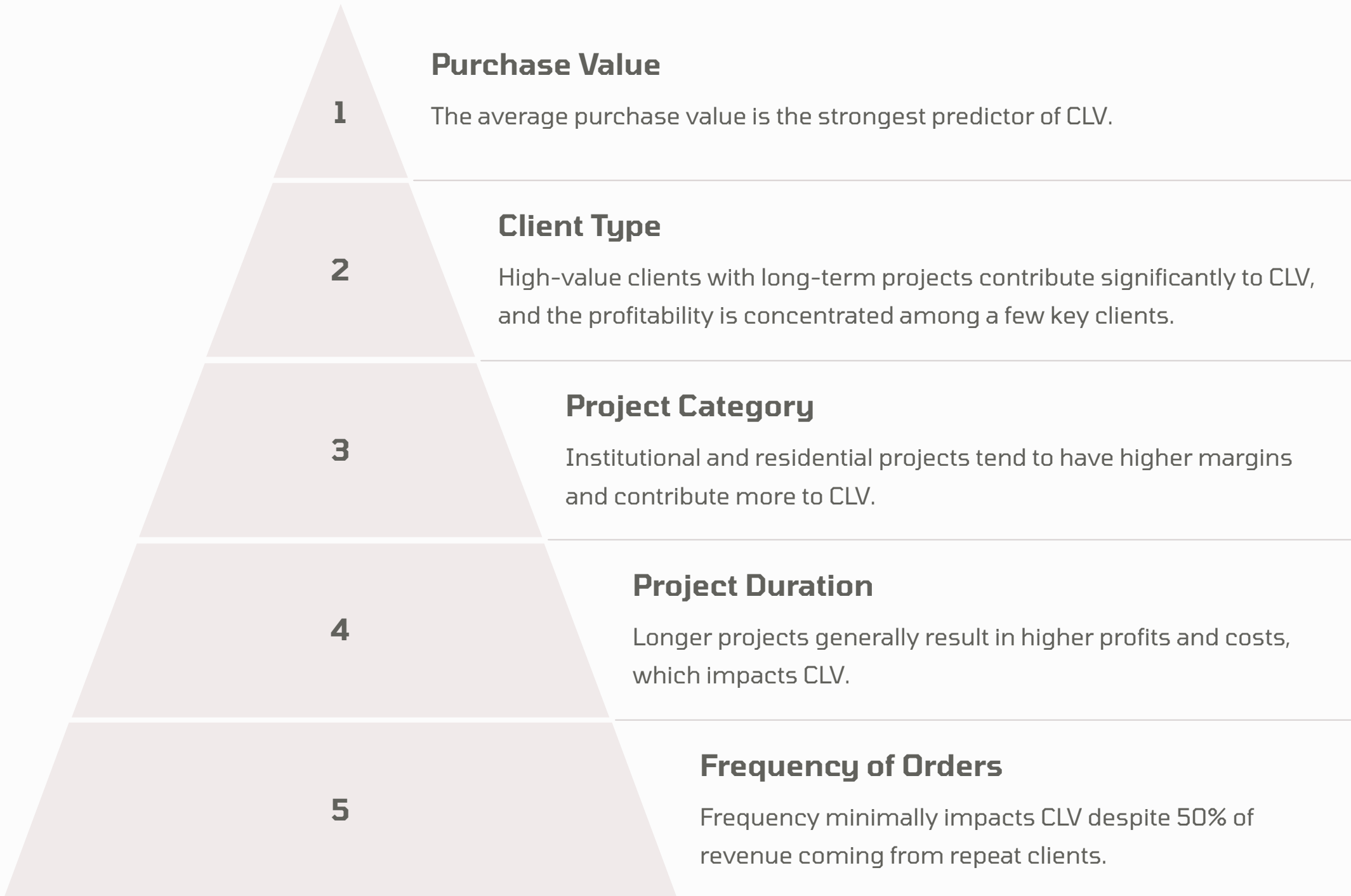- Al-Afaq Al-Mumtada Co Ltd (Commercial)

Top 10 Profitable Projects by Gross Profit Margin (%) and Duration
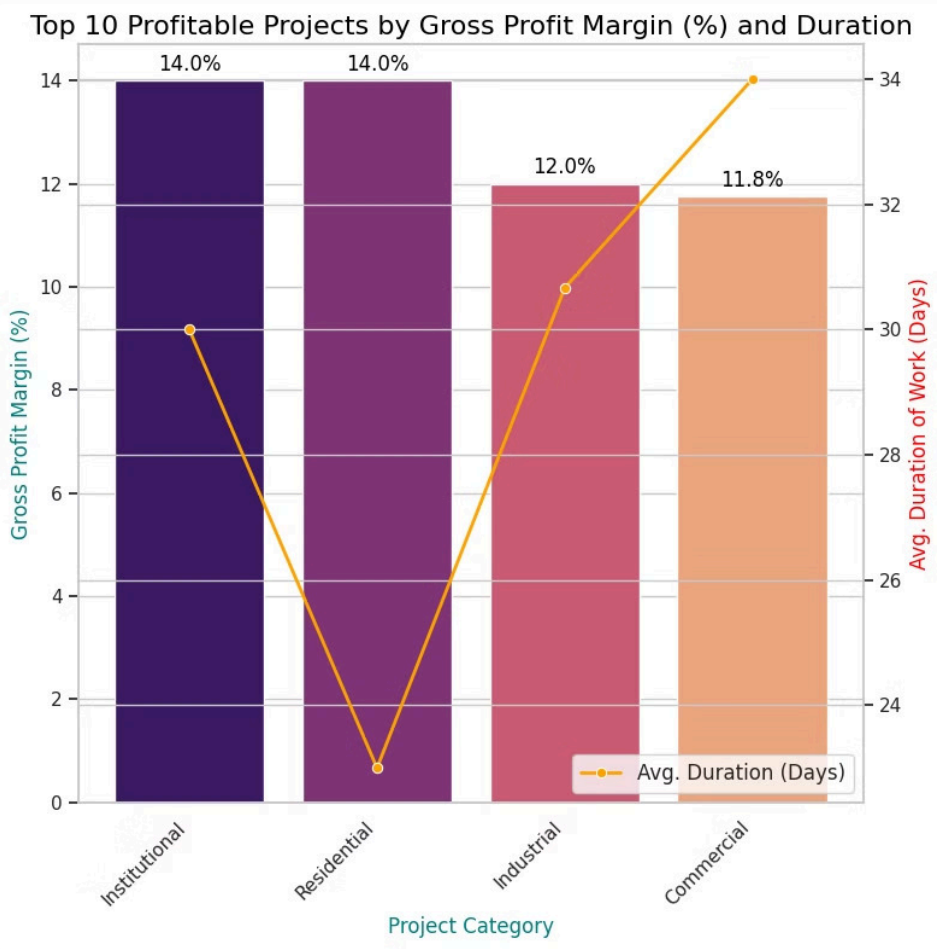
Clients can be broadly understood based on the project categories they are associated with.

Figure: Profitability and Efficiency Across Project Categories

Institutional and residential projects deliver the highest profit margins, while industrial projects show balanced profitability
and shorter durations.

Findings on Customer Lifetime Value Patterns

1

Purchase Value

The average purchase value is the strongest predictor of CLV.

2

Client Type

High-value clients with long-term projects contribute significantly to CLV, and the profitability is concentrated among a few key clients.

3

Project Category

Institutional and residential projects tend to have higher margins and contribute more to CLV.

4

Project Duration

Longer projects generally result in higher profits and costs, which impacts CLV.

5

Frequency of Orders

Frequency minimally impacts CLV despite 50% of revenue coming from repeat clients.
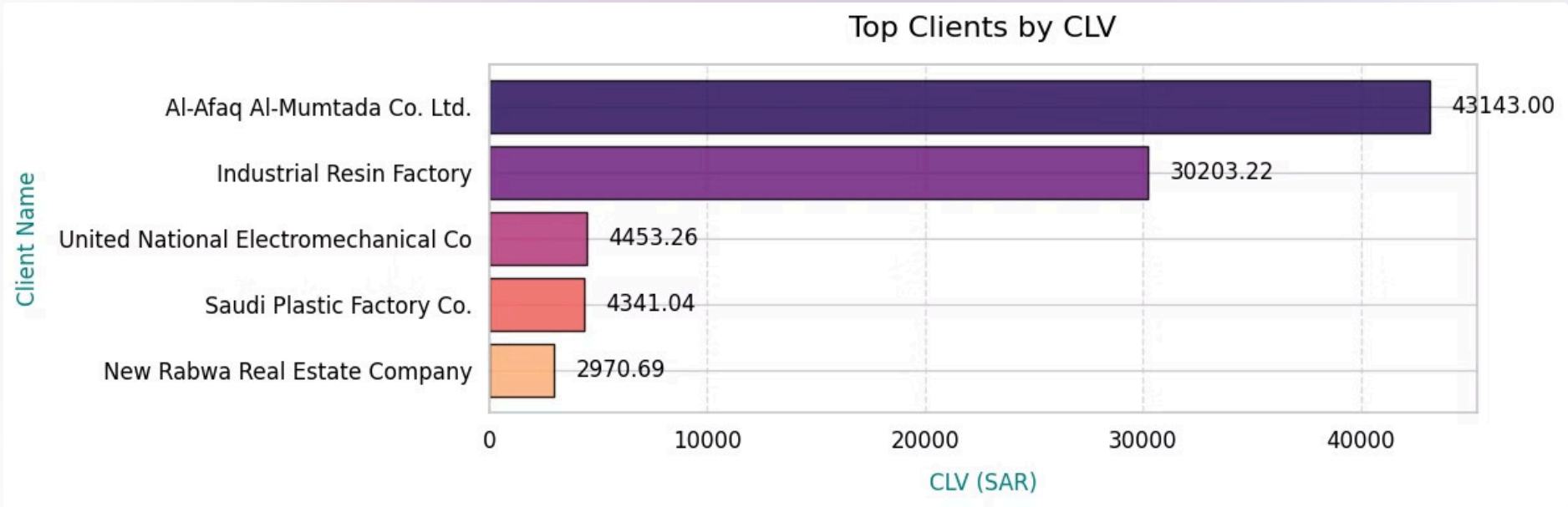
Made with Gamma

Figure: Key Clients Driving Business Value

Clients like Al-Afaq Al-Mumtada Co. Ltd. and Industrial Resin Factory account for substantial customer lifetime value, emphasizing their importance in sustaining growth.
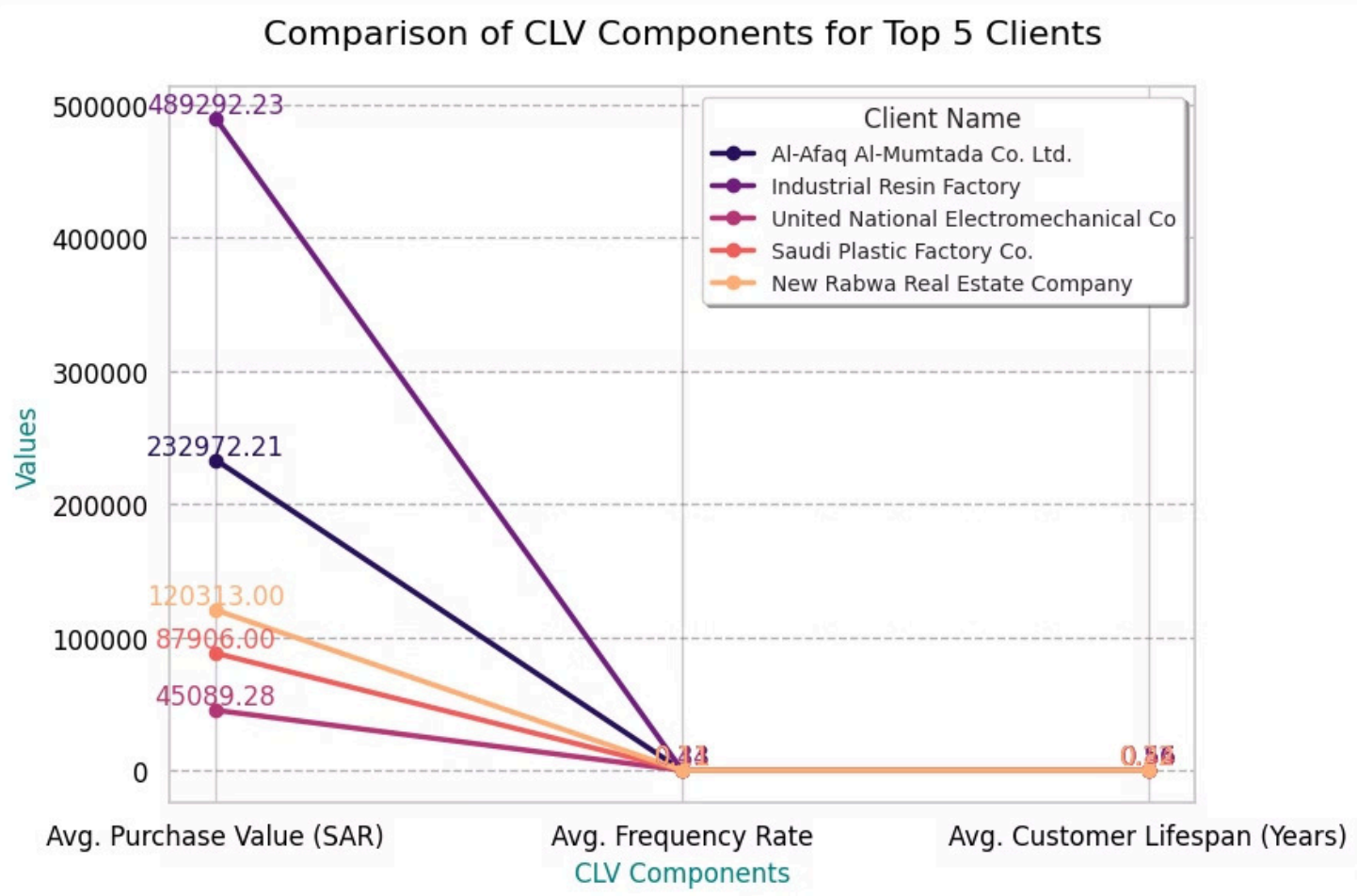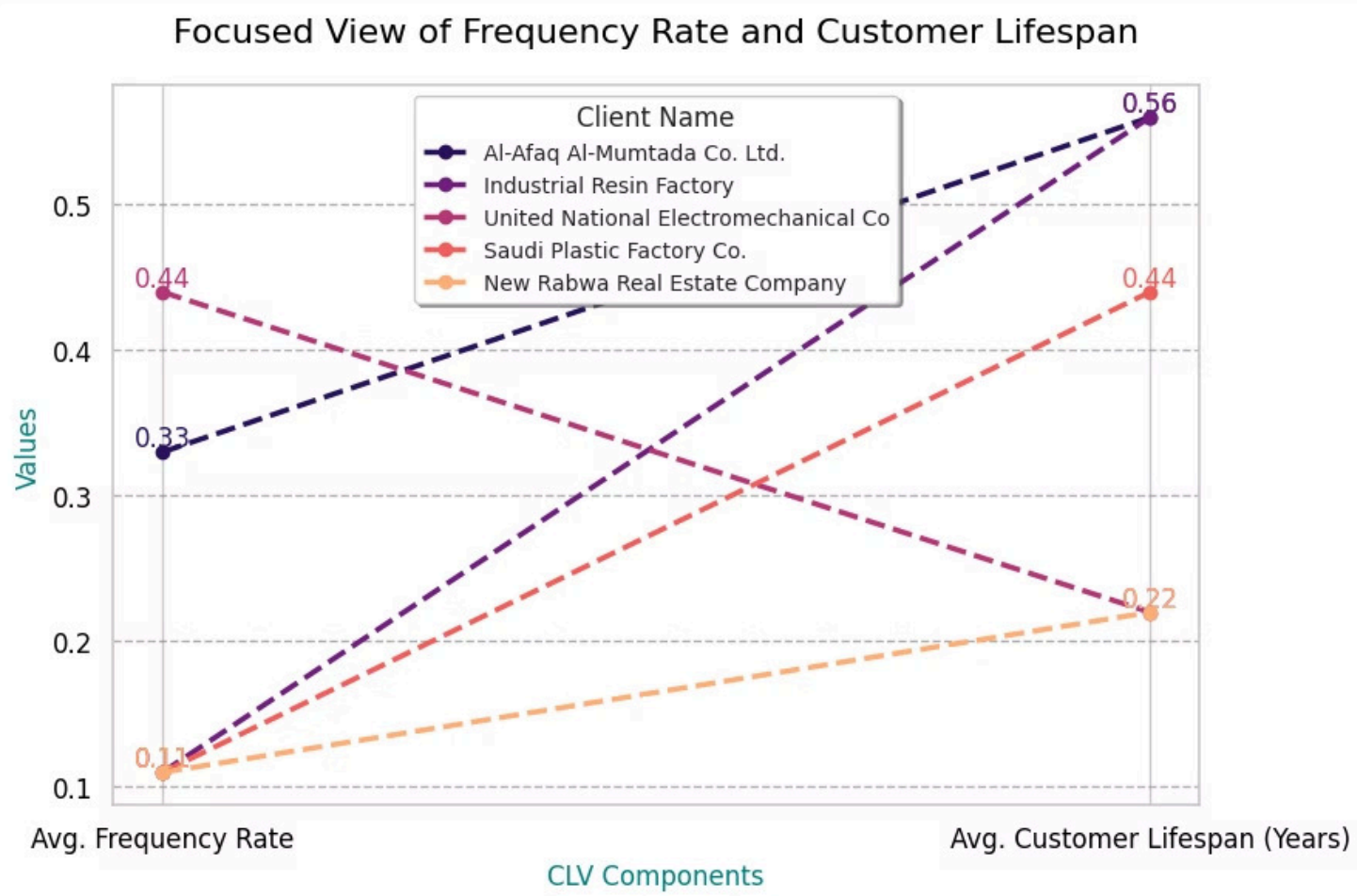

Figure: Analyzing Key Metrics for Top Clients

The breakdown of purchase values, engagement frequencies, and customer retention illustrates strategic opportunities for
client relationship management.

Made with Gamma

Targeted Recommendations

Project Scheduling Optimization

Implement efficient techniques like **Critical Path Method** (CPM) to minimize delays.

Use innovative building methods like **prefabrication** and modular construction to ensure higher standards of workmanship.

Data-Driven Resource Allocation

Use data analytics for informed resource allocation.

Focus on **institutional and residential** projects to improve resource allocation.

Minimize efforts on **low-CLV** clients.

Profitability Enhancement

Maximize profitability by optimizing pricing and processes.

Target **client clusters** based on their specific needs (bundle services for clients who require diverse offerings).

Client Relationship Management

Develop a robust **CRM** for personalized communication.

Build long-term partnerships with **high-CLV** clients by implementing loyalty programs.

Focus on **high-value, low-frequency** clients to secure repeat business.

Employee Development

Invest in **employee training** for worker safety and efficient project handling.

Strategic Partnerships

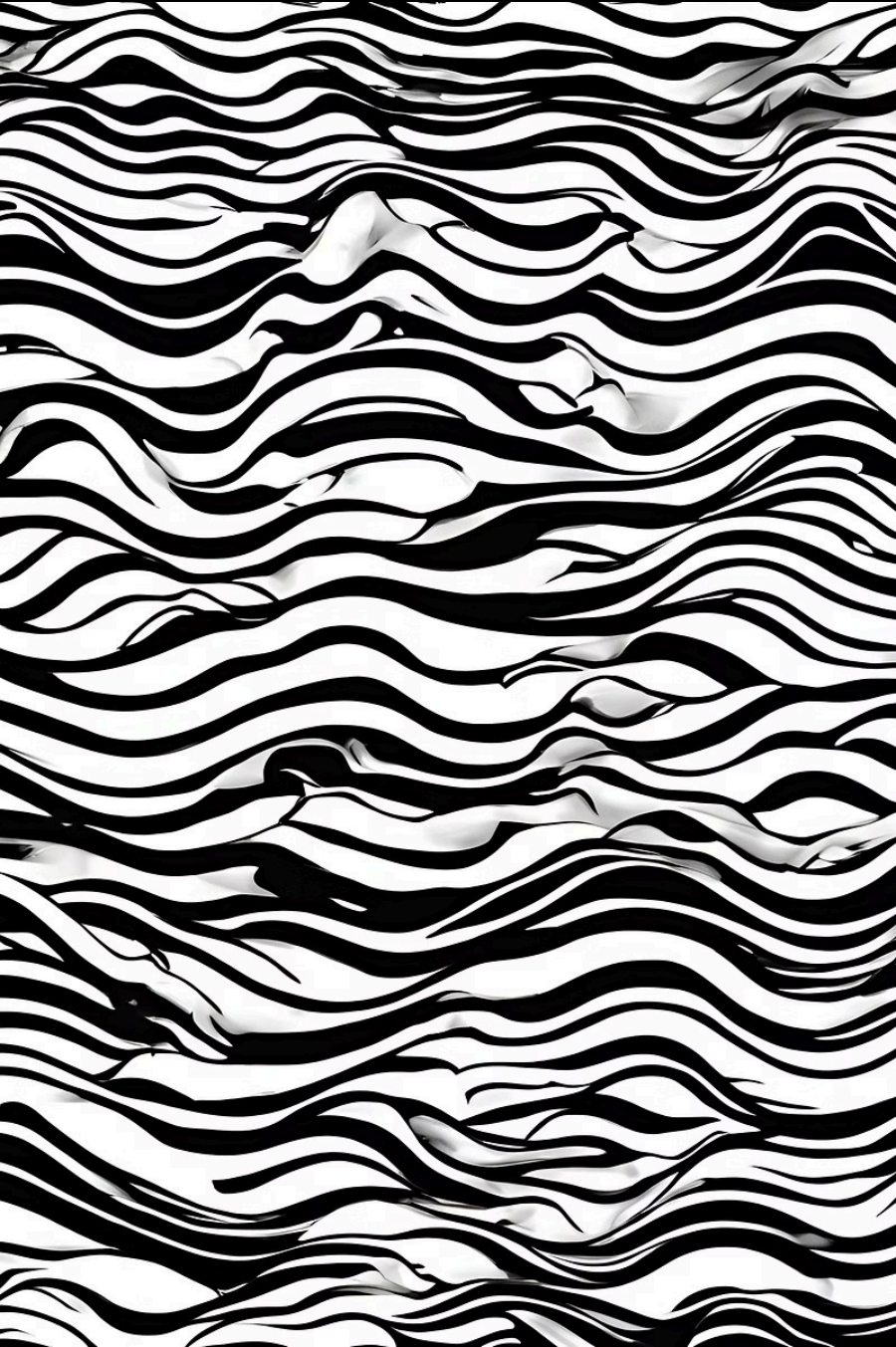Forge partnerships for reliable **resource access**.

Technology Adoption

Implement technologies like **CoConstruct** for enhanced efficiency.

Diversification

Expand into **new markets** to reduce reliance on single clients and expand services to smart building solutions and sustainable infrastructure to align with **global trends**.

THANK YOU

For further questions or discussions, you're welcome to contact me at **23f2004433@ds.study.iitm.ac.in**.