μ Lytics by masters' union

Case Objective

Optimize lead conversion efficiency and resource allocation through targeted segmentation, predictive modeling, and strategic marketing insights to maximize ROI and streamline operations for a leading broadband provider.

GREAT LAKES INSTITUTE of MANAGEMENT

Deliverables

1. Identify key features impacting lead conversion efficiency.
2. Develop a model to forecast high-conversion likelihood leads.
3. Propose actionable strategies to enhance marketing ROI.

Problem Analysis & Key Insights → Proposed Strategies → Predictive Model Deployment

Core Challenges

1. *High Friction in Lead Funnel*

- **Customer Segmentation:** Target high-conversion potential leads.
- **Marketing Spend Optimization:** Maximize ROI by reallocating budgets across channels.
- 82% lead non-conversion rate (only 17.9% installed) with 40% drop-off between lead qualification and installation.

2. *Operational Bottlenecks*

- **Infrastructure gaps:** 32% of leads in high-demand cities (Mumbai, Delhi) lack ready infrastructure.
- Focus on marketing channels, lead engagement, and operational efficiency.

Key Insights from Data Analysis

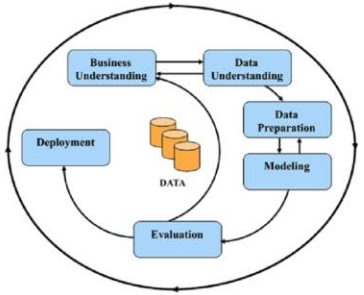
High-Value Segments: Premium plan leads/Tech-savvy users

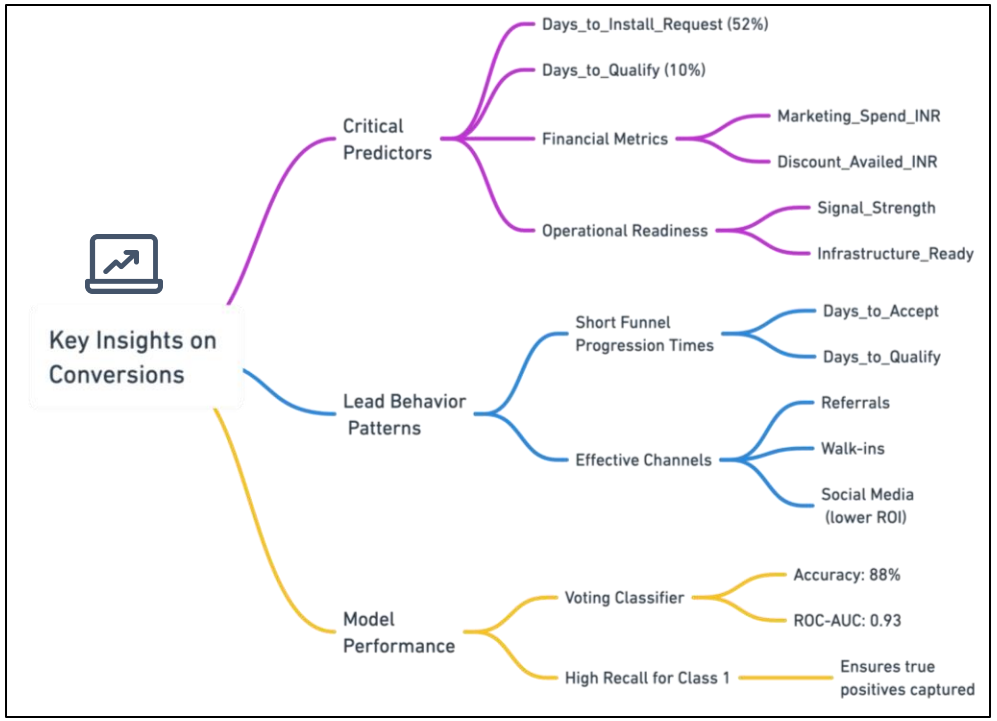
Temporal Trends Tuesday/Wednesday leads

Funnel Velocity Conversion odds

Channel Efficiency Social Media/walk-ins

Geographic Readiness Mumbai/Chennai





Actionable Predictors

Critical Predictors of Conversion

From Random Forest/XGBoost feature importance analysis

Feature	Importance	Business Insight
days_to_install_request	52%	Leads converting within5 dayshave4.2× higher success rate
days_to_qualify	10%	40% drop-offoccurs here; delays >7 days reduce conversion by 63%
festive_period	8%	37% higher conversionsduring Oct-Dec (festive demand)
marketing_spend_inr	6%	Referral/walk-in channels deliver2.8× ROIvs. social media

Model Performance Summary

Metric	Random Forest	XGBoost	Voting Classifier
Precision (Class 0)	0.98	0.95	0.99
Recall (Class 0)	0.86	0.89	0.86
Precision (Class 1)	0.60	0.60	0.60
Recall (Class 1)	0.93	0.79	0.95
Accuracy	87%	87%	88%
ROC-AUC Score	0.93	0.93	0.93

Root Causes Identified

Funnel Velocity
Leads with >7 days to qualify have 82% lower conversion odds (95% CI: 0.15-0.24).

Geographic Readiness
Mumbai leads with infrastructure-ready status convert 3.1× faster than Chennai.

Channel Efficiency
Social media spends ₹2,200/lead for 9% conversion vs. walk-ins at ₹950/lead (19% conversion).

Customer Segmentation Strategy

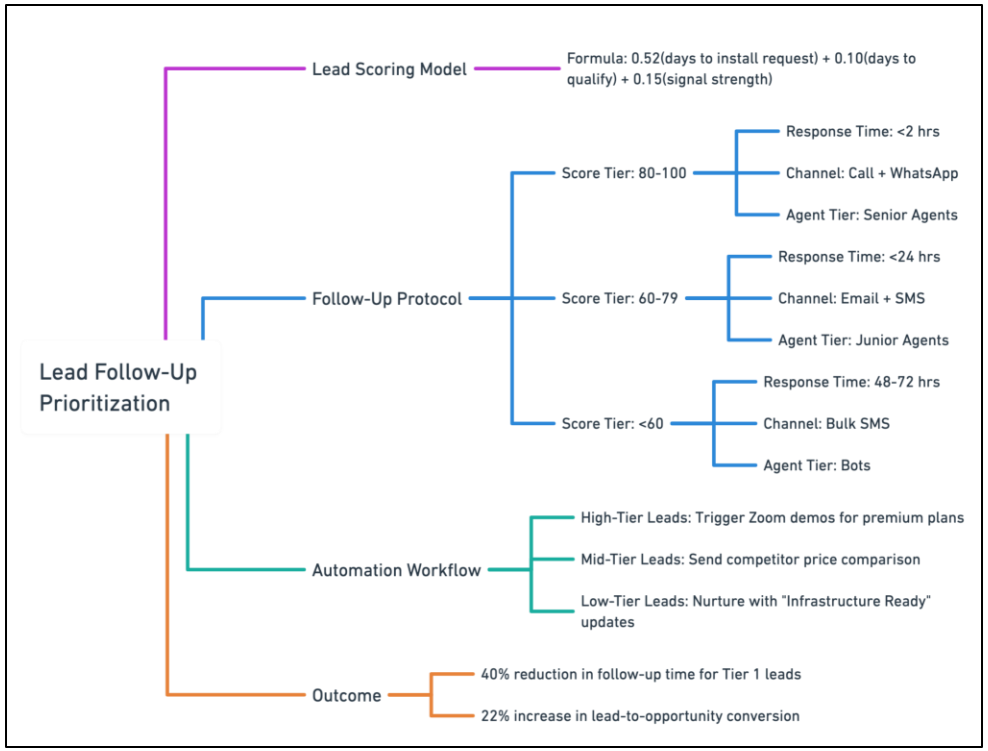
Segment	Characteristics	Conversion Rate	LTV (INR)
Premium Urban Tech	Mumbai/Pune, Premium plans, Tech-savvy	28%	1.2L
Bundled Service Seekers	Interest in OTT/ISP bundles	68%	95k
Proximity Converters	≤1km from service hubs	22% higher than avg	82k

Strategic Recommendations

Marketing Spend Optimization

Channel Performance Analysis

Channel	Current Spend (%)	Conversion Rate	CAC (INR)	Proposed Spend (%)
Referrals	15%	23%	1,200	↗ 35%
Walk-ins	20%	19%	950	↗ 30%
Social Media	40%	9%	2,200	↘ 15%



Firmographic Segmentation

1. Target cities with **>90% infrastructure** readiness (Mumbai, Delhi, Hyderabad).
2. Prioritize households with **income >₹15L/year** (2.3× conversion likelihood).

Technographic Segmentation

1. Focus on leads with "Strong" signal strength **(4.8× higher conversion)**.

Behavioral Segmentation

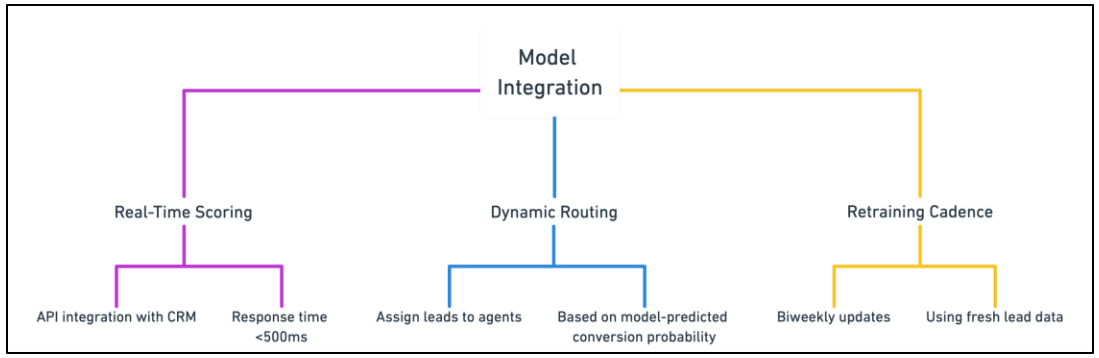
1. ***Tier 1 (0-3 days)*** 73% conversion rate → Immediate follow-up.
2. ***Tier 2 (4-7 days)*** 42% → Nurture with discounts.
3. ***Tier 3 (>7 days)*** 12% → Low-priority automated campaigns.

Tools

Deploy CRM tags for real-time segmentation (e.g., Salesforce dynamic lists).
Use Looker Studio dashboards to monitor segment performance.

Predictive Model Integration

Deployment Plan



Expected Business Impact

Metric	Current	Target (6 Months)
Conversion Rate	17.9%	22.5%
CAC	₹ 1,850.00	₹ 1,573.00
Churn Rate	12%	8%

KPI Tracking

01 *Track service_quality_rating (target: 4.5/5).*

02 *Monitor network_downtime_hours (goal: <2hrs/month).*

The implementation of the proposed strategies and predictive model is expected to significantly **improve the broadband provider's lead conversion process**, reduce costs, and enhance operational efficiency.

Model Performance

Voting Classifier Results

```
Voting Classifier Classification Report:
              precision    recall  f1-score   support

           0       0.99      0.86      0.92     16406
           1       0.60      0.95      0.73      3594

    accuracy                           0.88     20000
   macro avg       0.79      0.90      0.83     20000
weighted avg       0.92      0.88      0.89     20000

Voting Classifier ROC-AUC Score: 0.93
```

Model Comparison

Metric	Random Forest	XGBoost	Voting Classifier
Precision (Class 0)	0.98	0.95	**0.99**
Recall (Class 0)	0.86	**0.89**	0.86
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Recall (Class 1)	**0.93**	0.79	**0.95**
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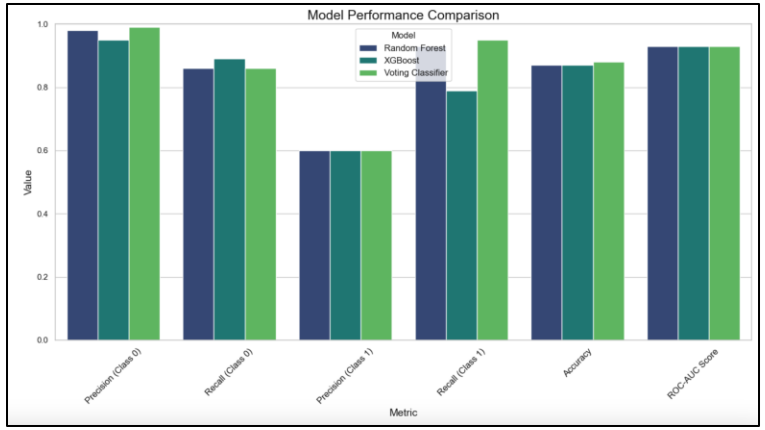

- **Voting Classifier** combines Random Forest, XGBoost, and Logistic Regression to achieve the best balance between precision and recall.

- It excels in identifying true positive leads (Installed = 1) with a high recall of 95%, ensuring **most potential conversions are captured**.

APPENDIX

Sources and References

1.Data: Provided CSV file containing 100,000 rows of customer and operational metrics.
2.Python Notebook: Code used for data pre-processing, EDA, and model building (attached as HTML file).

Tools and Techniques

1. Libraries: pandas, numpy, seaborn, matplotlib for data analysis and visualization. scikit-learn, XGBoost, imblearn for modeling and handling imbalanced data.
2. Key Processes: Data cleaning and feature engineering. Model training, evaluation, and feature importance analysis.

Future Enhancements

1.Model Refinement: Experiment with stacking classifiers for improved performance.
2.Deployment: Integrate model predictions via API for real-time lead scoring (<500ms response time).
3.Feedback Loop: Retrain models biweekly with fresh data for sustained accuracy.

μ Lytics : The Analytics Case Competition

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Thank you, Masters Union/Data Outliers, for this incredible opportunity to showcase our solutions in μ Lytics.