Data Mining

Implementation & Applications

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Agenda

- Data Mining & BI Vision
- Implementation: Success Criteria
- Knowledge Maturity: Data Analysis phases
- Data Mining Techniques
- Case Study: Segmentation & Sales Coverage Optimization
- Takeaways
Data Mining Vision

What Is Data Mining?

Huge amount of data

Data Exploration

Data Analysis

Pattern & Rules Discovery
Data Mining Vision

What Is Data Mining?

Data mining is the exploration and analysis by automatic or semiautomatic means of large quantities of data in order to discover meaningful patterns and rules.

For example, a pattern might indicate that married males with children are more likely to drive a particular sport cars than married males with no children. For a Marketing manger for an auto company this pattern could be quite valuable.
Data Mining Vision

Why Data Mining?

“You have no choice but to operate in a world shaped by globalisation and information revolution. There are two options: Adapt or die”

- Andy Grove, Chairman, Intel (May 1997-May 2005)

Your customers are not really your customers you are merely their care-taker until one of your competitors can provide and communicate a better offer.

Data mining is the cornerstone to optimize Customer Relationship Management by enabling:

- Customer Intimacy
- Customer Satisfaction
- Customer Retention
- Customer Up-sell Cross
- Customer Acquisition
Data Mining & BI Vision

**Data Mining & BI Vision:**
Develop & Implement Customers and Market knowledge to provide Strategic Intelligence to the Business for Best Practices and Profitable Actions

**Business Objectives**
- Customer Intimacy
  - Know your customers
- Customer Acquisition
  - Acquire new business from new customers
- Customer Up sell
  - Acquire new business from old customers
- Customer Satisfaction
  - Monitor & Ensure Customer Satisfaction
- Customer Retention
  - Retain existing business with current customers

**BI =**
Business Intelligence + Data + Intelligence + Technologies

That's a brain...

Data Mart
Data Ware house
DnB, InfoCan
StatssCan
IDC
Surveys
Data Mining Vision

Data Mining Virtuous Process

1. Identify Business Challenges where Data analysis can provide value
2. Transform data into actionable intelligence using data mining techniques
3. Act on the intelligence
4. Measure the results
Implementation : Success Criteria

To be successful Data Mining & BI need to have:

1. **Clear Vision**
   The High Management Team must take the leadership in creating and sharing the data driven vision for the company. And this vision will be the guideline of BI strategy.

2. **Strategy**
   The strategy is all about how to build and develop master components: (The market and competitive knowledge, consumer and customer knowledge.) This strategy must define objectives and metrics for attaining that goal. It directs the objectives of other operational and sales strategies and the CRM implementation strategy.

3. **Customer & Users Experience**
   The customer experience must be in line with the data driven vision and must be constantly reviewed, refined, and adjusted based on actively south interaction with customer.
Implementation : Success Criteria

4. Organizational collaboration

Changes to organizational practices, process, metrics, incentives, skills must be made to deliver the required customer experience. Ongoing change management and mindset will be the masterpiece.

5. Metrics

Company should set measurable BI objectives and monitor all levels of CRM indicators to turn customer into assets.

6. Integrated Process

Successful customer process reengineering should create integrated processes. These processes should meet customer expectation, support customer value proposal and provide competitive intelligence to optimize customer experience and profitability.
Implementation : Success Criteria

7. Information.

The be successful BI & Data mining requires the creation of market and customers information chain that flows around the company. This also requires a strong integration and communication between operational and analytical systems.

8. Technology and Tools

Technologies and tools represent the key part of the company portfolio and architecture. CRM application needs should be considered as the provision of the integrated functionality that support seamless customer centric processes across all area of the company and it partners.

9. Training & Implementation

Sales Representatives and every end user should be trained to leverage the power of strategic knowledge. The implementation will take place after change management and training completion.
Knowledge Maturity: Analysis Phases

- Statistical Analysis, Data Mining
- Forecasting
- Predictive Modeling
- Optimization
- Innovation

Why is this happening? Top line expansion, Prototype ideas driving best to market
What will happen next? What is the best that could happen? Data driven actions
What if these trends continue? Why is this happening?

Standard Reports
Query Drilldown
Ad Hoc Reports
Alerts

Data

Data, cleansed Data built information Foundation

Raw data, cleansed Data built information Foundation

Data Information Intelligence Knowledge

Business Intelligence Capability
# Data Mining Techniques

The 3 boxes approach: 1-Goal 2-Model 3-Data

<table>
<thead>
<tr>
<th>1-Defining your Data mining goal:</th>
<th>2-Choosing the Modeling Approach</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Profile Analysis</td>
<td>• Linear Regression</td>
</tr>
<tr>
<td>• Segmentation</td>
<td>• Logistics Regression</td>
</tr>
<tr>
<td>• Response</td>
<td>• Poisson Regression</td>
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<tr>
<td>• Risk</td>
<td>• Neural Networks</td>
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<tr>
<td>• Conversion</td>
<td>• Classification Tree</td>
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<tr>
<td>• Churn/Attrition</td>
<td>• Genetic Algorithms</td>
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<td>• NPV</td>
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<td>• CLTV</td>
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<table>
<thead>
<tr>
<th>3-Data Sources</th>
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</thead>
<tbody>
<tr>
<td>• Internal Data Source</td>
</tr>
<tr>
<td>• External Data</td>
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<tr>
<td>• Surveys Data</td>
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</table>
Data Mining Techniques: Target assignment using Segmentation

Segmentation often yields large gains in lift and total conversions, but it is still a blunt tool that learns only partially from actual results.

Target Based on Segment: Misses good pockets in other segments and includes the good with the bad within the targeted segment.
Data Mining Techniques: Target Assignment using scoring Models

Scoring models pick out the good pockets, and each time the models are re-fitted, they learn from actual results.
Data Mining Techniques: Target assignment using average

Targeting Employers with average characteristics may miss the diversity of Employers around the average.
Data Mining Techniques

Where Modeling Fits In

Transaction and Communication Behavior and Other Characteristics

Predictive Model + Business Rules

Target Assignments

Campaign Execution

Order Response
Data Mining Techniques

1-Define Business Challenge
2-Define Goal
3-Select Data
4-Prepare Data
5-Select & Transform variables
6-Process Model
7-Validate Model
8-Implement Model
9-Track Model ROI

Model Targeting Process
Data Mining Techniques  Optimal List Penetration

Statistical models score and rank a list, but the optimum percent of the list to target depends on P/L and other goals of the campaign

- Maximum conversions are achieved when 100% of the list is targeted
- Maximum profit is achieved at the threshold where cost per touch equals sales per touch
- Optimizing across channels (media mix) and campaigns means selecting for each potential target the channel and campaign with the largest expected profit

P/L illustration assumes $300 AOS and $0.41 cost per touch
## Data Mining Techniques

### Recipes' Matrix

<table>
<thead>
<tr>
<th>Business Challenges</th>
<th>Data Mining Solutions</th>
<th>Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Understand the Characteristics of your customers</td>
<td>Segmentation and Profiling Analysis</td>
<td>Customer profitability and CRM optimization</td>
</tr>
<tr>
<td>Attract new Customers</td>
<td>Target Response Model</td>
<td>Bring more customer for the same marketing costs</td>
</tr>
<tr>
<td>Up sell new Customers</td>
<td>CLTV Model</td>
<td>Identify long term profitability</td>
</tr>
<tr>
<td>Avoid High risk Customers</td>
<td>Risk and Approval Model</td>
<td>Avoid loss for the company</td>
</tr>
<tr>
<td>Make unprofitable customers become more profitable</td>
<td>Up-sell and cross-sell targeting model</td>
<td>Increase profit from existing customers</td>
</tr>
<tr>
<td>Retain your profitable Customers</td>
<td>Retention or Churn models</td>
<td>Increase wallet share growth and overall profitability</td>
</tr>
<tr>
<td>Increase Customer Satisfaction</td>
<td>Market Research and customer profiling</td>
<td>Increase Retention and Dollar to dollar renewal</td>
</tr>
<tr>
<td>Increase Sales</td>
<td>Acquisition &amp; Up-sell models</td>
<td></td>
</tr>
<tr>
<td>Reduce Costs/expenses</td>
<td>Target Models</td>
<td></td>
</tr>
<tr>
<td>Win-back your lost customers</td>
<td>Win back Models</td>
<td>Increase Sales and profitability</td>
</tr>
</tbody>
</table>
Case Study: Segmentation & Sales Coverage Optimization

Business Objectives

- Score and Segment the Canadian universe of 1.7M Companies
- Build Calibrated portfolios for Territory Assignment by Employee size by Regions and by industries
- Build the Segmentation Matrix (Customers and Prospects)
- Define CRM Activities for each segment
Case Study: Segmentation & Sales Coverage Optimization

**Purpose**: Score & Segment Canadian universe of 1.7M companies

**Goal**: Identify best customers for growth and equip sales with product & marketing support to capture high value potential

**Inputs & Factors**:
- D&B Firm Graphic Data
- Macro Economic Data
- Transactional Data
- Online & Off line Posting Data
- Seeker & Traffic Data

**Data Mining**: Regressions Models

**Outputs**:
- Score 0 to 100
- Define Segments High, Medium, Low

**Outputs Implications**: Acquisition Retention & Up-sell prioritization

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  - Define Segments High, Medium, Low
- **Outputs Implications**: Acquisition Retention & Up-sell prioritization
Case Study: Segmentation & Sales Coverage Optimization

**Purpose**: Build Calibrated portfolio for Acquisition and Retention

**Goal**: Maximize Sales Coverage

**Constraints Factors**:
- Regions: Western Ontario QC-MAR
- Employee Size group
- Same Number of records
- Identical industries Distributions
- Identical Opportunity Score

**Data Mining**

**Optimization Models**

**Outputs**:
- Calibrated portfolios
- Targeted Acquisition, Retention & Up-sell activities

**Outputs Implications**
### Case Study: Segmentation & Sales Coverage Optimization

#### Build the Segmentation Matrix

<table>
<thead>
<tr>
<th>Customer Scoring</th>
<th>Prospect Scoring</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Customer Scoring Matrix" /></td>
<td><img src="image" alt="Prospect Scoring Matrix" /></td>
</tr>
</tbody>
</table>

**Company Value**: (last 12,24,36 months or life time spend)

**Company Potential**: Opportunity score from data mining scoring model

**Propensity to convert**: likelihood that a brand will purchase within the next months

**Scoring help Acquisition Retention and up-sell activities prioritization**
### Case Study: Segmentation & Sales Coverage Optimization

Define CRM strategies and activities for each segment

<table>
<thead>
<tr>
<th>Segments</th>
<th>Strategies /Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Customers</strong></td>
<td><strong>High Retention efforts Keep &amp; Protect</strong></td>
</tr>
<tr>
<td>9 - 6 - 3</td>
<td><strong>Medium Retention efforts Grow &amp; Up sell</strong></td>
</tr>
<tr>
<td>8 - 5 - 2</td>
<td><strong>Low Retention efforts Grow</strong></td>
</tr>
<tr>
<td>7 - 4 - 1</td>
<td><strong>High acquisition efforts Tier1</strong></td>
</tr>
<tr>
<td><strong>Prospects</strong></td>
<td><strong>Medium acquisition efforts Tier2</strong></td>
</tr>
<tr>
<td>9 - 6 - 3</td>
<td><strong>Low Acquisition Efforts Tier3</strong></td>
</tr>
<tr>
<td>8 - 5 - 2</td>
<td></td>
</tr>
<tr>
<td>7 - 4 - 1</td>
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Case Study: Segmentation & Sales Coverage Optimization

Benefits /Virtuous Process Results

1. Customer Retention increase of 15 percent
2. Sales force productivity increase of 40 percent
3. Marketing efficiency increase of 40 percent
4. Increased Market Share
5. Increased Customer profitability
Takeaways & Conclusion?

R1: Data Mining & BI Vision

R2: Knowledge Maturity Data Analysis

R3: Recipes” Matrix (What approach to use)

R4: Segmentation Matrix (Acquisition Retention Up-sell)
Questions Comments

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Appendixes
Territory Assignment Methodology

To ensure a good calibration of each portfolio:
- Same number of prospects
- Same company size across all territories/region
- Same opportunity (H,M,L) across all territories
- Same prospect potential (Score) across all territories
- Representative distribution of industries /territories

A Multi Stage Cluster Random Sampling methodology has been used to optimize the Territory Assignment.
Territory Assignment Optimization model

1-Objective : Build 19 calibrated portfolios

2-Constraints:

2-1 Assign Rep by tiers (size :1-40 and 40-999)
2-2 Build territory using 3 Regions/Time Zone . (ON, QC & Maritimes, Western Canada)
2-3 Calibrate the total number of prospects across territories in every region and tiers
2-3 Calibrate the total number of prospects (H,M,L) across territories in every region and tiers
2-4 Calibrate the Opportunity Score across all territories in every region and tiers
2-5 Calibrate the Company size across all territories in every region and tiers
2-6 Generate 6 portfolios for 40-999 employees size

3-Decision Variables:

3-1 Region/Time Zone
3-2 Opportunity Score
3-3 Opportunity Segment
3-4 Company size
3-5 Industries