When you’re drowning in collections, optimising your swimming technique can be helpful.
Debt Collection and Recovery Life Cycle

**Early Collections**
- Remind
- Self-cure
- Prevent deterioration

**Late Collections**
- Resolve payment issue
- Prevent charge-off / write-off

**Recovery**
- Maximise recovery

**Focus**
- High volumes
- Operational Expense
- Service Level

**Challenge**
- How to contact? (Call, Text, Letter, CCS)
- When to contact?

**Decisions**
- Whom to restructure?
- How to restructure?
- Pre-approved offer?

- Low conversion rates
- Low recovery rates

- Work internally?
- Place where?
- Sell?
Decision Optimization is a prescriptive analytic solution designed to discover and evaluate optimal decision strategies that satisfy multiple business objectives.
What is a Decision Impact Model?

A **Model** that represents the complex interaction between the:

- Criteria used in a Decision
- Decision(s) to be taken
- Reactions to and Outcome of the Decision(s)
- Objectives of a Decision Strategy

The purpose of a **Decision Impact Model** is to assist decision makers in making better decisions in complex situations.

By modelling the Decision itself:

- it allows for better decisions to be identified (@ account, segment, portfolio)
- compared to those made today, and
- potentially identify the optimal Decision to meet the Objectives
At the Heart of Decision Optimization is the Decision Model

<table>
<thead>
<tr>
<th>Inputs</th>
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<td>Key metrics and constraints</td>
<td>Primary goals, subject to constraints</td>
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<tr>
<td>Application data</td>
<td>Who to accept</td>
<td>Response</td>
<td>Expected profit</td>
<td>Net interest income</td>
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<tr>
<td>Behavior data</td>
<td>What to offer</td>
<td>Activation</td>
<td>Expected losses</td>
<td>Risk adjusted revenue</td>
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<td>Customer data</td>
<td>Change of terms</td>
<td>Revenue</td>
<td>ROE / ROA</td>
<td>Economic profit</td>
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<tr>
<td>Bureau data</td>
<td>Pro-active vs. re-active</td>
<td>Loss</td>
<td>Average rate relative to market</td>
<td>Activations</td>
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<tr>
<td>Market conditions</td>
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<td>Utilization</td>
<td>Percent targeted</td>
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<td>Demographics</td>
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<td>Repayment</td>
<td>Offer distribution</td>
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<td>Competitor data</td>
<td></td>
<td>Attrition</td>
<td>Operating expenses</td>
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</tbody>
</table>

Predictive Modelling

Simulation

Optimisation
Example 1: Operational Segmentation – How should I treat my customers?

- **Very Low Risk**: No Contact
  - 0% Intensity

- **Low Risk**: Tone: Friendly
  - 75% Intensity

- **Medium Risk**: Tone: Reminding
  - 200% Intensity

- **High Risk**: Tone: Firm
  - 350% Intensity
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<td>Customer data</td>
<td>Whom to contact</td>
<td>Full Payment</td>
<td>Cured Balances</td>
<td>Impairments</td>
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<td>Account Data</td>
<td>When to contact</td>
<td>Partial Payment</td>
<td>Improved Balances</td>
<td>Charge-Offs</td>
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<tr>
<td>Behaviour Scores</td>
<td>Channel to use</td>
<td>Inbound Call</td>
<td>Channel Volumes</td>
<td>Write-Offs</td>
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<td>Payment History</td>
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<td>Attrition</td>
<td>Staff Requirements</td>
<td>Cure Rates</td>
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<td>Contact History</td>
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<td>OpEx</td>
<td>Cash Collected</td>
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<td>Bureau data</td>
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Example 2: Restructures – Common Observations

- Too little too late
- Only focus on the known good customers
- Low solution take-up ratios
- Insufficient range of restructure instruments
- Looking to cover losses/increase profit from credit-stressed customers
- High post-restructure default rates
- Many business units involved in the process
- Over-restructuring—erosion of portfolio quality
- Too many blind spots over policy adoption, process and solution effectiveness
- Too rigid an interpretation of regulation
Restructures - Combinatorial explosion

The number of constrained restructure options will run to multi millions.

What will be the top 3 restructure shapes for each of the 3 customers that achieve the business goal. E.g. <10% restructure default rate within 6 months.

What will the options be for 1000’s of customers that qualify?

What are the different options that could be scenario played and what are the implications of each scenario?

Which of the following would you chose for each and what influences the choice?

<table>
<thead>
<tr>
<th>Key</th>
<th>Contractual instalment and remaining term</th>
<th>Restructure</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Reduced monthly for x months recouped within term</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Reduced monthly for x months recouped over longer term</td>
<td></td>
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<tr>
<td></td>
<td>Term extension</td>
<td></td>
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<tr>
<td></td>
<td>Multiple step up within term</td>
<td></td>
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<tr>
<td></td>
<td>Multiple step up with term extension</td>
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<tr>
<td></td>
<td>Reduced monthly for x months followed by balloon payment</td>
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</table>

<table>
<thead>
<tr>
<th>Customer profile</th>
<th>PD</th>
<th>EAD</th>
<th>LGD</th>
<th>Terms remaining</th>
<th>Profit model</th>
<th>Future Revenue</th>
<th>NPV of doing nothing</th>
<th>Impact on Portfolio</th>
<th>IRR</th>
<th>DCF &amp; CH</th>
<th>Total Exposure</th>
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<tr>
<td>Low risk 29 years</td>
<td>Low</td>
<td>$9,400</td>
<td>36.5%</td>
<td>36</td>
<td>2%</td>
<td>1%</td>
<td>&gt;5%</td>
<td>$5,000</td>
<td>7 months</td>
<td>&lt;30%</td>
<td>$2,900</td>
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<tr>
<td>Medium risk 62 years</td>
<td>Med</td>
<td>$14,700</td>
<td>36%</td>
<td>36</td>
<td>3%</td>
<td>1%</td>
<td>$10,000</td>
<td>7 months</td>
<td>&lt;30%</td>
<td>$1,700</td>
<td>1 product</td>
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<td>High risk 72 years</td>
<td>High</td>
<td>$4,700</td>
<td>60%</td>
<td>60</td>
<td>3%</td>
<td>1%</td>
<td>&lt;5%</td>
<td>$30,000</td>
<td>4 months</td>
<td>&lt;30%</td>
<td>$8,000</td>
</tr>
</tbody>
</table>
Restructures - Maximize NPV impact

\[
\Delta NPV = \left( NPV_{solution} - NPV_{unchanged} \right) \times takeup_{solution}
\]

- **Analytics**
  - Probability and time of (re-)default
- **Take-up probability per customer segment**
- **Operations**
  - Ensure appropriate solution is selected for each customer
- **MI**
  - Re-defaults (vintage view)
  - Risk indicators (15+/30+)
- **Lean process**
  - Little paperwork
  - Immediate Offer/Decision
- **Step-by-step conversion rates per solution (campaign to closure)**
Restructures – Two similar decision problems

**Campaign Optimisation**
- Which customers to approach for restructure?
- Whether to make pre-authorized offer? (arrears capitalisation, instalment reduction, payment holiday, interest reduction)
- Typically before discussion with customer - without up-to-date income and expenditure data

**Event Optimisation**
- How to restructure? (arrears capitalisation, instalment reduction, payment holiday, interest reduction)
- Which parameters to offer (instalment, term, interest, step-ups)
## Decision Impact Model – Restructure Campaign

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### Customer data
- Account Data
- Behaviour Scores
- Payment History
- Restructure History
- Policy

### Application Data
- Application Data
- Bureau data
- Demographics

### Whom to approach
- Available Income
  - Take-up
- Re-default
  - Time to re-default

### What to offer
- Balance restructured
- Provision Released

### What to pre-approve
- Re-defaults
- Staff Required

### Available Income
- Provision Released
- NPV Improved
- NPL Ratio
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<td>Re-default</td>
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Example 3: Recovery - Optimisation of Work/Place/Sell Decisions

ECA Score
- Probability to pay
- Amount if pay

Constraints
Policy & Business driven
- In-house capacity
- Min/Max % per channel
- Max # for agency A
- Min $ for agency B
- Max % for sale
- Min $ for sale

Late Collections
Primary Placement
Secondary Placement
Tertiary Placement

- Liquidation Rates
- Operational Costs

- Which Agency?
- Liquidation Rates
- Commissions

- Price
- Cost of Sale

Work
Place
Sell
Bottom Line
## Decision Impact Model – Recovery (Work/Place/Sell)

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<td>DCA Allocations</td>
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<td>Behaviour Scores</td>
<td>Which DCA to use</td>
<td>Agency</td>
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<td>Return from Sale</td>
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<td>Placement History</td>
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Summary

- **Portfolio Performance & Profitability**
  - Restructures
  - Work/Place/Sell

- **Operative Expenditure & Efficiency**
  - Capacity Management
  - Contact Management
  - Balancing Costs und Service Level

- **Scenario Simulation**
  - Better understand impact of decisions
  - Better understand impact of constraints
  - Conscious, strategic selection of operating point
Thank You