Predictive Analytics in life insurance

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Beyond descriptive statistics

- Predictive analytics is the use of data to generate predictive insights in order to make smarter decisions that improve performance of businesses and drive strategy to outlast the competition. Analytics should go beyond description of the past and should provide actionable insights about the future. This discussion will educate you on the full potential of the application of techniques.
Overall methodology
... and why researching/understanding analytics is complex

<table>
<thead>
<tr>
<th>Phase</th>
<th>Description</th>
<th>Understanding Business Problem</th>
<th>Data Collection</th>
<th>Data Cleansing</th>
<th>Analysis of Data</th>
<th>Model Selection</th>
<th>Variable Selection</th>
<th>Parameterization and Optimization</th>
<th>Results Presentation and Implementation</th>
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<tbody>
<tr>
<td><strong>Description</strong></td>
<td>Identify the key questions to answer, problems to solve, and business constraints</td>
<td>Collect and understand data and variable representations</td>
<td>Validate, standardize, and transform data</td>
<td>Analyze variables, distributions, correlations, and clustering</td>
<td>Identify appropriate modelling options based on business problem and data available</td>
<td>Identify preliminary variables that appear to be significant predictors</td>
<td>Train different models and variable combinations to determine the optimal model and parameters</td>
<td>Present results in a manner that can be understood by senior management of various technical backgrounds. Embed the predictive model into business processes</td>
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Predictive analytics applications

Sales and Marketing
• Build more effective, targeted marketing campaigns
• Identify customers likely to purchase products
• Provide appropriate product recommendations

Underwriting
• Identify best risks and strategically prioritize underwriting efforts
• Improve simplified underwriting and streamline underwriting processes
• Expand underwriting information using new sources

Agency Management
• Recruit advisors most likely to become successful
• Optimize agent retention efforts
• Monitor performance of agents

Inforce Management
• Profile and segment customers
• Identify and retain policyholders likely to surrender
• Design retention strategies and offer additional products to current customers
• Analyze customer satisfaction

Pricing, Reserving, and Experience Studies
• Develop accurate, competitive pricing and pricing structure
• Identify new experience drivers using augmented data
• Improve reserving accuracy
• Improve understanding of experience drivers

Claims Management and Fraud Detection
• Analyze claim frequency and severity
• Prioritize claims resources
• Identify likely fraudulent or rescinded claims

Other applications
• Provide insights using HR/workforce Analytics
Canadian analytics application prioritization

Applications
1. Cross-selling/ Up-selling
2. Risk-Based Segment Targeting
3. Distribution Partner/ Client Matching
4. New Business Application Triage/ Simplified UW
5. Underwriting Process Improvement
6. Underwriting Application Simplification
7. Customer Retention/ Lifetime Value
8. Pricing Risk Score
9. Experience Studies Policyholder Behavior
10. Experience Studies Mortality
11. Fraud Detection
12. Workforce Analytics
Applications
1. Agency Management
2. Claims Management
3. Product Design
4. Direct to Consumer Targeted Marketing
5. Predictive Underwriting
The efforts of the profession – Canadian Institute of Actuaries initiatives

- **CIA Predictive Modeling Committee**’s mission is to promote the application of the actuarial skillset to predictive modeling and to market actuaries as skilled experts in this field. More specifically the committee will:
  - a) Promote the role of actuaries in the predictive modeling field both within and outside the profession;
  - b) Identify needs for new research in the field of predictive modeling that will draw attention to the work of actuaries; and
  - c) Communicate existing research and case studies of work in the field through various media
  - d) Influence the Education Curriculum and CPD offering to include relevant predictive modeling techniques

- **CIA Predictive Modeling Committee**’s initiatives included:

<table>
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<tr>
<th>Promotion within/outside</th>
<th>Needs for research</th>
<th>Communication/Dissemination</th>
<th>Influence curriculum</th>
<th>Collaboration/Relationship</th>
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<tbody>
<tr>
<td>Profile Series in e-bulletin of Predictive Modelers (stories from actuaries and non-actuaries and their work in PM, start with committee members and then expand), target 3 within first year</td>
<td>Organize a webcast</td>
<td>Get on CPD sessions</td>
<td>(Ongoing) Connect with other organizations to coordinate/collaborate</td>
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<td>Booklet about why and applications</td>
<td>Monitor CPD opportunities and inform the CIA for inclusion in the CPD opportunities e-mail</td>
<td>Provide input into the CIA curriculum in support of the alignment with the curriculum adopted by other organizations (CAS and SOA)</td>
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<td>Organize a CIA event</td>
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<td>Web-based index of strong reference documents relating to Techniques and Applications [completed]</td>
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<td>Expand the Web-based index to include links to tools [completed]</td>
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