

CIA Request for Proposals

The Use of Predictive Analytics, Machine Learning, and AI in the Canadian Property and Casualty (P&C) Insurance Industry

Background and purpose

The increasing availability of big data and the use of advanced analytics is changing how insurers have traditionally operated. P&C insurers are continuing to explore and implement new ways of utilizing these resources in everyday practice to optimize results, and there are many new approaches and opportunities that could be learned from other industries. The purpose of this study is to investigate and benchmark how the Canadian P&C insurance industry is utilizing predictive analytics, machine learning, and AI, and examine potential areas for enhancement. In this study, the Canadian P&C insurance industry means all products sold by Canadian P&C insurers, personal, commercial and including reinsurance products. Life and health products are excluded.

Research objective

The Canadian Institute of Actuaries (CIA) is seeking researchers to evaluate the current practice of Canadian P&C insurers with respect to predictive analytics, machine learning, and AI in light of recent literature on the subject. The following are examples of proposed topics that may be addressed:

- How are P&C insurers currently using or planning to use predictive analytics, machine learning, and AI in business operations, risk mitigation, and management practice? Examples include, but are not limited to:
 - using these approaches in valuation and pricing such as to better understand and set policyholder-behavior assumptions;
 - underwriting or marketing to better understand policyholder/customer potential risk type and the propensity to claim; and
 - claims management and to identify fraud.
- What data and methodologies are being used to enhance the results of traditional problems or to address new opportunities?
- How could new technologies such as quantum computing impact these methodologies?
- What are companies trying to learn through these methodologies that cannot be obtained by traditional methods?

- What challenges are faced by P&C insurers in applying these methodologies and how are companies addressing or planning to address these issues? How have stakeholders been engaged in utilizing nontraditional methods?
- How do the approaches and methodologies differ by company characteristic (e.g., company size), line of business, or product type (e.g., personal lines vs commercial lines)?
- Are companies relying on internal or external resources to perform these methodologies?
- Who is performing the analysis (actuaries, data scientists, statisticians, others)?
- What is the regulator's input and perspective on the use of these methodologies?

Note that the above list is not meant to be exhaustive but merely examples of proposed topics that may be researched.

Preference will be given to proposals that demonstrate:

- a strategy for obtaining necessary information from industry players (if needed, the project oversight group (POG) can provide basic support in networking within the P&C industry);
- actionable novel approaches to enhance different business functions or applications in P&C industry; and
- benchmarking within the Canadian P&C space with respect to the usage and maturity of predictive analytics, machine learning, and AI applications.

Proposal

To facilitate the evaluation of proposals, the following information should be submitted:

- A. Résumés of the researchers or graduate students expected to participate, indicating how their background, education, and experience bear on their qualifications to undertake the research. If more than one researcher is involved, an individual should be designated as the lead researcher and primary contact. The person submitting the proposal must be authorized to speak on behalf of all the researchers as well as for the firm or institution on whose behalf the proposal is submitted.
- B. An outline of the approach to be used (e.g., literature search, model, etc.), emphasizing issues that require special consideration. Details should be given regarding the techniques to be used, collateral material to be consulted, and possible limitations of the analysis.
- C. A description of the expected deliverables and any supporting data, tools, or other resources.

- D. Cost estimates for the research, including computer time, salaries, report preparation, material costs, etc. Such estimates can be in the form of hourly rates, but in such cases, time estimates should also be included. Any guarantees as to total cost should be given and will be considered in the evaluation of the proposal. While cost will be a factor in the evaluation of the proposal, it will not necessarily be the decisive factor.
- E. A schedule for completion of the research, identifying key dates or time frames for research completion and report submissions. The CIA is interested in completing this project in a timely manner. Suggestions in the proposal for ensuring timely delivery, such as fee adjustments, are encouraged.
- F. Other related factors that give evidence of a proposer's capabilities to perform in a superior fashion should be detailed.

Selection process

The CIA has appointed a POG to oversee the project. Its members are Joel Li (Chair), Qi An, Alena Kharkavets, Steven Caluori, Jill Harper, Jim Liu, and Simon Tam. The CIA Research Council is responsible for the selection of the proposal to be funded. Input from other knowledgeable individuals also may be sought, but the CIA will make the final decision.

Questions

Any questions regarding this RFP should be directed to [Shlomit Jacobson](#), CIA Program Manager, Research, at 613-216-9089.

Notification of intent to submit a proposal

Please email your intent to submit a proposal by **July 3, 2020** to Shlomit Jacobson (see address above).

Submission of a proposal

Please email a copy of the proposal to Shlomit Jacobson (see address above).

Proposals must be received no later than **August 1, 2020**. It is anticipated that all proposers will be informed of the status of their proposal by **September 15, 2020**.

Note: Proposals are considered confidential and proprietary.

Conditions

The CIA reserves the right not to award a contract for this research. Reasons for not awarding a contract could include, but are not limited to, a lack of acceptable proposals or a finding that insufficient funds are available. The CIA also reserves the right to redirect the project as is deemed advisable.

The CIA plans to hold the copyright to the research and to publish the results with appropriate credit given to the researcher(s).

The CIA may seek public exposure or media attention for the research. By submitting a proposal, you agree to cooperate with the CIA in publicizing or promoting the research and responding to media requests.

The CIA may also market and promote the research to members, candidates, and other interested parties. You agree to perform promotional communication requested by the CIA, which may include, but is not limited to, leading a webcast on the research, presenting the research at a CIA meeting, and/or writing an article on the research for a CIA newsletter.