Professionalism in a Dynamic Environment

The Challenge of AI

Presentation to: Casualty Actuaries of Europe
Barry Franklin, CAS President Elect
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Presenter Bio

BARRY FRANKLIN, FCAS, CERA

Barry Franklin is a risk management and insurance executive with more than 40 years of experience in a variety of actuarial and risk management leadership roles. He recently retired as Chief Actuary for Zurich North America; previous roles included North American regional Chief Risk Officer for Zurich, North American Corporate Risk Consulting Director for Towers Watson, Group Managing Director for Aon Global Risk Consulting, and Partner & Consulting Actuary with EY.

Barry is a Fellow of the Casualty Actuarial Society and a Chartered Enterprise Risk Analyst. He has been active in actuarial profession leadership for many years, having served on the CAS board of directors and executive council as well as numerous CAS committees and task forces, and currently serves as President-Elect of the CAS. Barry holds a Bachelor of Sciences degree from Northern Illinois University, with a major in Probability & Statistics and minor in Economics.

Discussion Outline

- AI and the Casualty Actuary
  - What do we mean by AI?
  - Where do/will casualty actuaries encounter AI in their work?
  - How do/will casualty actuaries apply AI?
- Professionalism Implications of AI
  - What professionalism challenges does AI pose?
  - What current SOPs apply to the use of AI in actuarial work?
  - What gaps remain?

AI and the Casualty Actuary

Artificial Intelligence Defined

- the application of computer systems able to perform tasks or produce output normally requiring human intelligence, especially by applying machine learning techniques to large collections of data:
  - "artificial intelligence allows us to understand sales cycles better" · "researchers are using artificial intelligence to identify the type and severity of diseases" · "our aim is to develop an artificial intelligence screening system"
- a program or other piece of software that performs tasks or produces output normally requiring human intelligence:
  - "the artificial intelligence is fed a training set of data that includes both the relevant problems and their solutions"

Source: Oxford Languages

Where do/will Actuaries Encounter AI?

- Research
  - Distilling key insights and conclusions from voluminous documents
  - Interrogating AI tools to understand new/complex topics
- Analysis
  - Identifying statistical relationships withing large, diverse datasets
  - Data scrubbing, scraping, augmentation
- Task Automation
  - Producing computer code and developing models
  - Creating and editing reports

AI as an **Approach** Actuaries Might Apply

- the application of computer systems able to perform tasks or produce output normally requiring human intelligence, especially by applying machine learning techniques to large collections of data

In many ways this is an enhancement of existing actuarial practice, enabled by greatly improved computing power and advanced analytical tools. Examples might include:

- Utilizing natural language processing models to fill in missing or invalid claim record fields from associated underwriting and policy records (data scraping)
- Augmenting claim records with external data (weather, road conditions)
- Augmenting underwriting files with external data (satellite images, tax records)

Key considerations are the **degree of control** the actuary exercises over the process and the **ability to validate** results

AI as a **Tool** Actuaries Might Use

- a program or other piece of software that performs tasks or produces output normally requiring human intelligence:

In many cases this represents the use of a model developed by a third party, and not within the actuary's area of expertise or knowledge. Examples might include:

- Using a publicly available AI tool to research key financial drivers of an industry or business, to assist the actuary in preparing an analysis and/or report
- Using a publicly available AI tool to write computer code as part of developing a rating model
- Relying on AI tools (proprietary or public) to produce an initial draft actuarial report

Key considerations are the actuary's **understanding of the model**, **ability to validate** results and **degree of control** over the final workproduct

Professionalism Implications of AI

Professionalism Challenges of AI

“Passive” Challenges

- Data provided to an actuary may have been generated, edited or augmented using AI
- Models relied on by an actuary may have been created using AI
- AI tools are not 100% error free
- Bias avoidance
- Data privacy/confidentiality

“Active” Challenges

- Third party AI tools not easily understood or audited
- Actuaries using AI tools to create or modify data, computer code or models must be able to validate results
- Actuaries utilizing AI tools must be prepared to defend results

Standards of Practice and AI: What ASOPS Might an Actuary Look to?

- ASOP 12: Risk Classification
- ASOP 21: Responding to or Assisting Auditors or Examiners in Connection with Financial Audits, Financial Reviews, and Financial Examinations
- ASOP 23: Data Quality
- ASOP 41 Actuarial Communications
- ASOP 56: Modeling
- ASOP 58: Enterprise Risk Management

Do ASOPs Provide Sufficient Guidance for Actuaries with Respect to AI?

- Do ASOP 38 (Catastrophe Modeling) and ASOP 56 (Modeling) adequately consider AI? ASOP 38 was once titled “Using Models Outside the Actuary’s Expertise” and was developed in response to the development of third-party catastrophe models. It was later made more specific to CAT models. This puts the onus on ASOP 56 to address (non-cat) models reliant ion AI.
- Does ASOP 23 (Date Quality) adequately address the use of data that may have been created/curated utilizing AI?
- Other ASOPs are more general and would certainly apply, though AI may pose some interesting challenges in interpreting those ASOPs

ASOP 23: Data Quality

- 1.2 SCOPE: This ASOP provides guidance to actuaries when selecting data, performing a review of data, using data, or relying on data supplied by others, in performing actuarial services. The ASOP also applies to actuaries who are selecting or preparing data, or are responsible for the selection or preparation of data, that the actuary believes will be used by other actuaries in performing actuarial services, or when making appropriate disclosures with regard to data quality.
- 3.3 REVIEW OF DATA: A review of data may not always reveal defects. Nevertheless, the actuary should perform a review, unless, in the actuary's professional judgment, such review is not necessary or not practical.
- 3.8 LIMITATION OF THE ACTUARY'S RESPONSIBILITY: The actuary is not required to do any of the following:
  - a. determine whether data or other information supplied by others are falsified or intentionally misleading;
  - b. compile additional data solely for the purpose of searching for questionable or inconsistent data; or
  - c. perform an audit of the data.

ASOP 56: Modeling

- 1.2 SCOPE: This standard applies to actuaries in any practice area when performing actuarial services with respect to designing, developing, selecting, modifying, or using all types of models. For example, an actuary using a model developed by others in which the actuary is responsible for the model output is subject to this standard.
- 2.2 DATA: Facts or information that are either direct input to a model or inform the selection of input. Data may be collected from sources such as records, experience, experiments, surveys, observations, benefit plan or policy provisions, ***or output from other models***. (emphasis added)
- 3.1.4 MODEL STRUCTURE: The actuary should assess whether the structure of the model (including judgments reflected in the model) is appropriate for the intended purpose. **IS THIS EVEN POSSIBLE IF USING AI?**

Disclose, disclose, disclose…ASOP 23

[Actuarial] communication should contain the following disclosures when relevant and material:

- a. the source(s) of the data;
- b. any limitations on the use of the actuarial work product due to uncertainty about the quality of the data…
- c. whether the actuary performed a review of the data and, if not, the reason for not reviewing the data and any resulting limitations…
- d. in summary form, unresolved concerns the actuary may have about questionable data values that are relevant to the use of the data …
- e. in summary form, discussions of any significant steps the actuary has taken to improve the data due to identifying questionable data values or relationships…
- f. in summary form, significant judgmental adjustments or assumptions that the actuary applied to the data or to the results, or are known by the actuary…
- g. the existence of results that are highly uncertain or have a potentially significant bias of which the actuary is aware due to the quality of the data…
- h. the extent of the actuary's reliance on data and other information relevant to the use of the data supplied by others…
- i. …if any material assumption or method was prescribed by applicable law…
- j. …if the actuary states reliance on other sources and…disclaims responsibility for any material assumption or method selected by a party other than the actuary;
- k. …if, in the actuary's professional judgment, the actuary has otherwise deviated materially from…this ASOP.

Disclose, disclose, disclose…ASOP 56

- If the actuary relies on a model designed, developed, or modified by others, such as a vendor or colleague, and the actuary has a limited ability either to obtain information about the model or to understand the underlying workings of the model, the actuary should **disclose** the extent of such reliance. In addition, the actuary should make a reasonable attempt to have a basic understanding of the model, including the following, as appropriate:
  - a. the designer's or developer's original intended purpose for the model;
  - b. the general operation of the model;
  - c. major sensitivities and dependencies within the model; and
  - d. key strengths and limitations of the model.
- When relying on models developed by others, the actuary should make practical efforts to comply with other applicable sections of this standard.

AAA Discussion Paper

- The American Academy of Actuaries published a discussion paper in September 2024 titled “Actuarial Professionalism Considerations for Generative AI”
- General Considerations
  - Is the use of GenAI appropriate to the assignment?
  - How does your use of AI tools meet your professionalism responsibilities?
- Practical Considerations
  - GenAI Model Selection
  - Reliance Considerations

AAA Discussion Paper, cont.

- Evaluating and Validating GenAI Models
  - Validation for quantitative applications
  - Additional validation concepts for qualitative applications
- GenAI Model Documentation - may focus on how the actuary:
  - Confirmed the model structure meets the actuary's intended purpose
  - Evaluated model results
  - Evaluated and mitigated model risk
- Conclusion
  - GenAI has not changed our professional standards

Suggested References

- “AI and Professionalism”; Contingencies magazine; July/August 2023
- “An Actuarial View of Data Bias: Definitions, Impacts, and Considerations”; American Academy of Actuaries, July 2023
- “Understand model risk management for AI and machine learning”; EY; May 2020
- A Primer on Generative AI for Actuaries; Society of Actuaries; February 2024
- Four Principles of Explainable Artificial Intelligence; National Institute of Standards and Technology; U.S. Department of Commerce; August 2020

What Does AI say* about AI and Professionalism?

- **Ethical and Professional Standards**
  - **Integrity and Objectivity**: Actuaries must ensure AI outputs are unbiased and not misleading. Over-reliance on opaque algorithms can compromise objectivity if the underlying assumptions aren't transparent.
  - **Compliance with Codes of Conduct**: The principles-based approach of actuarial codes (e.g., integrity, competence, communication) applies directly to AI use. Actuaries must ask not only “Can I use this?” but “Should I?”.
- **Model Governance and Transparency**
  - **Explainability of AI Models**: Many AI models, especially deep learning systems, are “black boxes.” Actuaries must be able to explain and justify model behavior to stakeholders, regulators, and clients.
  - **Validation and Peer Review**: AI models require rigorous validation. Casualty actuaries must ensure peer review processes are adapted to assess AI-driven outputs effectively.
- **Qualification and Competence**
  - **Staying Current**: Actuaries are expected to maintain competence. This includes understanding AI technologies, their limitations, and ethical implications.
  - **Training and Education**: The profession is evolving, and actuaries must pursue ongoing education in data science and AI to remain qualified under standards like the USQS (U.S. Qualification Standards).

What Does AI say* about AI and Professionalism?, cont.

- **Qualification and Competence**
  - **Staying Current**: Actuaries are expected to maintain competence. This includes understanding AI technologies, their limitations, and ethical implications.
  - **Training and Education**: The profession is evolving, and actuaries must pursue ongoing education in data science and AI to remain qualified under standards like the USQS (U.S. Qualification Standards).
- **Risk of Misuse and Misinterpretation**
  - **Misapplication of AI Tools**: Using AI without understanding its limitations can lead to flawed actuarial opinions. Casualty actuaries must ensure AI is used appropriately for the context
  - **Data Privacy and Security**: AI systems often rely on large datasets. Actuaries must ensure compliance with data protection laws and ethical handling of sensitive information
- **Communication and Disclosure**
  - **Clear Communication of Limitations**: Actuaries must disclose when AI tools are used and explain their limitations, especially in regulatory filings or client reports
  - **Speaking Up**: If an actuary believes AI is being misused or poses risks, they have a professional duty to raise concerns—even if it challenges organizational norms

*Responses from CoPilot to “what professionalism concerns does artificial intelligence create for casualty actuaries?

Concluding Thoughts

- AI presents significant opportunities for actuaries, but raises a number of potential challenges with respect to professionalism
- Current ASOPs do not specifically consider the use and impact of AI in actuarial work, but provide a useful framework for actuaries to follow
- Actuaries should continue to find ways to leverage AI as both an enabling technology and a set of powerful tools
- As with any new areas of actuarial practice or emerging technology, documentation and disclosure are the actuary's best defense!

Discussion and Questions

Thank You!