Increasing Actuarial Performance While Building Trust with AI

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AI is a Major Focus in the SOA's Strategic Plan

Our Focus

1 Optimize the candidate pipeline	**2** Grow globally	**3** Leverage AI

1 **Optimize the Candidate Pipeline:** Strengthen the actuarial profession by attracting, retaining, and supporting candidates throughout their journey.

2 **Grow Globally:** We are a strong global brand and will focus globally to better meet the needs of our candidates and members.

3 **Leverage AI:** Offer opportunities for developing AI expertise and promote innovation in actuarial work.

We'll talk through key strategies for building trust and using AI effectively

1. Understanding Risks
2. Keeping the Actuary in the Loop
3. Knowing Use Cases
4. Understanding Professionalism / Bias
5. Education

Ten Top AI Risks

Lack of AI transparency and explainability	Loss of data privacy using AI tools	Biases inherent in AI	Lack of morality in AI
Extreme results and other unintended consequences	Lack of empathy of the AI system	Unpopularity of automated interface	Reputation risk triggered by AI errors
	Model risk	Lack of sufficient number of sufficiently skilled people to build and oversee AI systems	

High-stakes AI requires humans in the loop—and actuaries are uniquely positioned to fill that role.

- Example: Why a Human in the Loop is needed:
  1987 Stock Market Crash Example
  - Algorithm used for portfolio insurance companies to sell relentlessly with no Human Oversight
  - Result: 20% + single-day drop in market. Proof that automation without humans could fail in edge cases
- Why Human in the Loop is Important in Insurance
  - Decisions are financial and human-impacting
  - Systemic failures resemble market crashes
  - High need for edge cases, ethics & fairness, regulatory compliance, and rapid environmental changes

Focus on Explainability with Human in the Loop

- Most AI Models are Black Box Models with opaque internal workings, knowing input and outputs only
  - They consist of many parameters and proprietary/confidential models
- Why this matters in insurance:
  - Regulatory expectations
  - Model governance & auditability
  - Trust with management and stakeholders
- Methods to explain:
  - Techniques such as SHAP and LIME
  - Visualization-based explainability tools such as waterfall charts, heat maps, & decision trees

AI Use Cases

AI Use Cases

Categorized from SOA Member AI Survey – Summer 2025

Reporting and Documentation	Coding	Data & text analysis and validation	Presentation & Communication Support
Research	Brainstorming & Idea Generation	Routine tasks: example note taking	Information Retrieval and Q & A
	Risk Evaluation & Bias Assessment	Governance and Compliance	

AI Use Cases
Specifics from SOA Member AI Survey – Summer 2025

- Reporting and Documentation
- **Coding:** Generation and Debugging
- **Data & Text analysis and validation:** NLP summarization and classification; Predictive analytics support, clustering analysis, claims review assistance, fraud detection, data cleaning, spreadsheet support, etl assistance
- **Presentation and Communication Support:** Presentation Prep, slide deck support, document drafting, communication polishing, email drafting
- **Research:** regulatory interpretation and documentation interpretation
- Brainstorming & Idea Generation
- **Routine Tasks:** Workflow automation, note taking, etc.
- Governance & Compliance
- **Information Retrieval and Q & A:** Chatbot querying
- Risk Evaluation & Bias Assessment

Why Bias / Professionalism is important in terms of AI

From Health Inequities to Societal Bias: Insights from an Expert Panel on AI and Actuarial Responsibility

- Panel made it clear AI can reflect bias in data
  - One Panelist stated "the data is not the data" meaning what appears to be a neutral fact can carry the context, nuance, and social and behavioral science dimensions that shape its interpretation.
- Key themes in discussion:
  - Historical data and objective truth are different
  - Flawed inputs create compound bias
  - Build ethics into operations
  - Actuaries need to be like social scientists
  - Importance of the Human in the Loop

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AI Transparency: Why it matters

Transparency does not equal explainability
- Explainability shows how a model makes decisions; transparency shows how it was built, governed, and monitored

Transparency includes model purpose & limits, training data sources and bias, decision traceability, and clear accountability

Risk of poor transparency is models may perform well in testing but fail when applied outside their data context

Practical tools for transparency: Model cards, data documentation, audit trails, and governance frameworks

AI Professional Development available from the SOA

PD Edge+	AI Insights Meeting	AI Bulletin	AI Insights Podcasts
Emerging Topics Community Subgroup	AI Safety Institute Consortium Subgroup	Actuarial Innovation and Technology Strategic research	AI content at major meetings
	AI articles in The Actuary Magazine		

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