Asian Actuarial Conference 2025 Bangkok

The Optimised Actuary

12 Nov | 14:10-14:55

Steven Claxton

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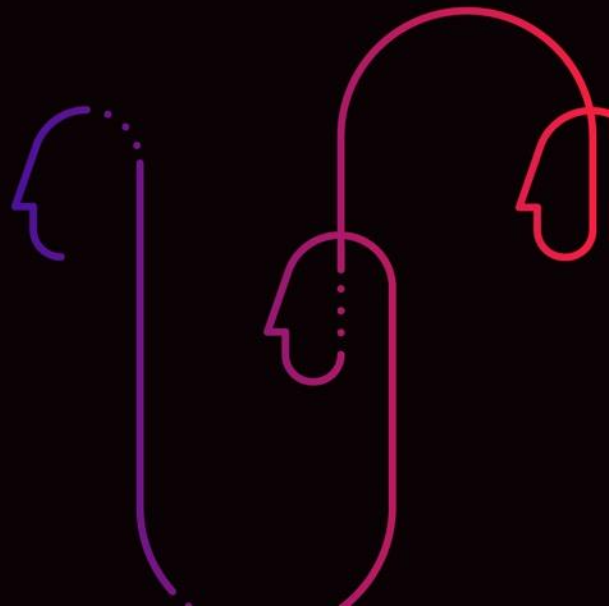
THE OPTIMISED ACTUARY



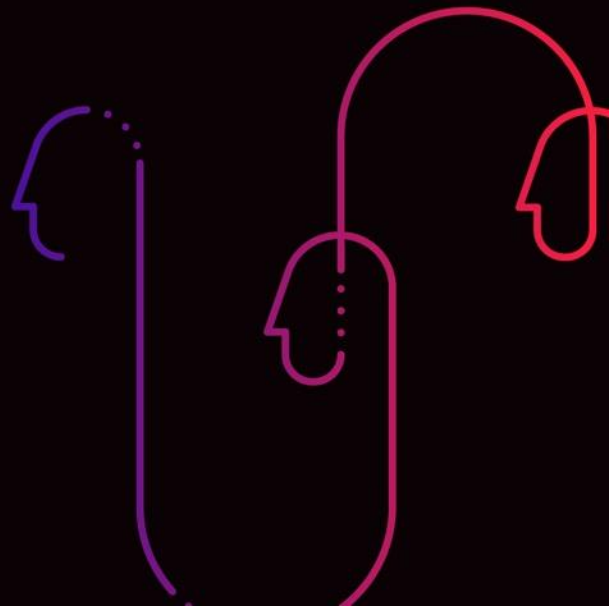
Changing Role of Actuary

AGENDA

- Statement of Intent (SOI)
- Context: IAA AI Task Force
- AI Use Cases
- Next Steps: Path to the ‘Optimised Actuary’

STATEMENT OF INTENT

Context



STATEMENT OF INTENT (SOI): FUTURE STATE

Technological advancements, ranging from cloud computing, Machine Learning (ML) through to Artificial Intelligence (AI), should allow the Actuary to ‘optimise’ their operational processes across regulatory/accounting interpretations, data management, modelling, and validation activities. Optimising, or ‘outsourcing repetitive process to technological based solutions’, should free the **Actuary to focus on strategic initiatives** such as customer experience, product innovation and sustainable balance sheet growth.

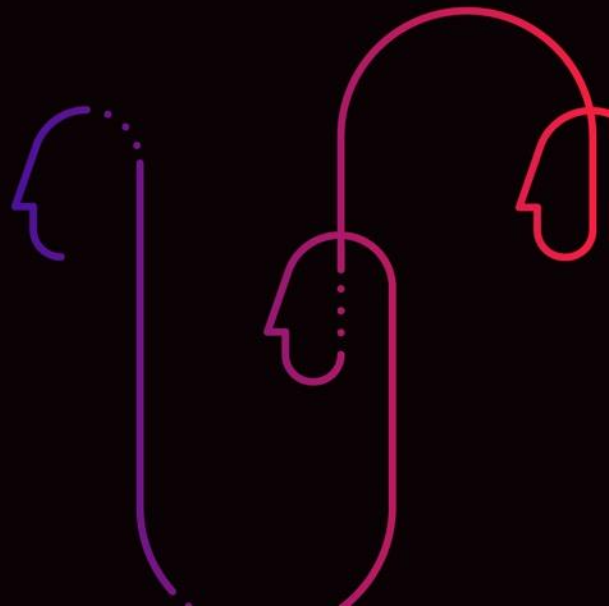
CONTEXT: AI BANK OF ENGLAND (2024) SURVEY

"For the purposes of the survey and this report, **artificial intelligence is defined as the simulation of human intelligence by machines, including the use of computer systems, which have the ability to perform tasks that demonstrate learning, decision-making, problem solving, and other tasks which previously required human intelligence**."

- **Use & adoption**: "Foundational models form 17% of all AI use cases"
- **Third-Party exposure**: concentration of providers {Cloud, Model, Data}
- **Automated decision-making**: "Only 2% of use cases have fully autonomous decision making"
- **Materiality**: 62% classified as low materiality
- **Understanding of AI System**: 46% 'partial understanding' (mode)
- **Benefits and risks of AI**: "… operational efficiency, productivity, and cost base"
- **Constraints**: data protection & privacy
- **Governance and accountability**: "84% of firms reported having an *accountable person* for their AI framework"

Source: https://www.bankofengland.co.uk/report/2024/artificial-intelligence-in-uk-financial-services-2024

IAA AI TASK FORCE



Supporting the SOI

IAA AITF: PHASE 1 2024

Mobilisation

Phase 1 - 2024

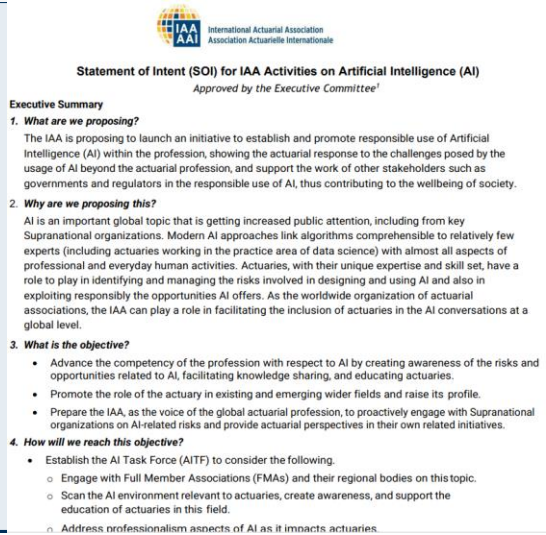
2024 Deliverables *(Access restricted to members)*

The first phase of work was completed by five workstreams, which established a framework for the IAA initiatives:

- Workstream 1: Professionalism and Ethics (led by Peter Withey) » **Members**
- Workstream 2: Education (led by Henning Wergen and Valarie du Preez) » **Members**
- Workstream 3: Changing Role of Actuaries (led by Steven Claxton) » **Members**
- Workstream 4: Governance (led by Bogdan Tautan) » **Members**
- Workstream 5: Innovation (led by Tim Bishop and Alice Locatelli) » **Members**

Artificial Intelligence Task Force (AITF) Consolidated Deliverables 2024

Summary Update on 2024 Deliverables – September 2024



International Actuarial Association
Association Actuarielle Internationale

Statement of Intent (SOI) for IAA Activities on Artificial Intelligence (AI)

Approved by the Executive Committee[1]

Executive Summary

1. ***What are we proposing?***

   The IAA is proposing to launch an initiative to establish and promote responsible use of Artificial Intelligence (AI) within the profession, showing the actuarial response to the challenges posed by the usage of AI beyond the actuarial profession, and support the work of other stakeholders such as governments and regulators in the responsible use of AI, thus contributing to the wellbeing of society.

2. ***Why are we proposing this?***

   AI is an important global topic that is getting increased public attention, including from key Supranational organizations. Modern AI approaches link algorithms comprehensible to relatively few experts (including actuaries working in the practice area of data science) with almost all aspects of professional and everyday human activities. Actuaries, with their unique expertise and skill set, have a role to play in identifying and managing the risks involved in designing and using AI and also in exploiting responsibly the opportunities AI offers. As the worldwide organization of actuarial associations, the IAA can play a role in facilitating the inclusion of actuaries in the AI conversations at a global level.

3. ***What is the objective?***

   - Advance the competency of the profession with respect to AI by creating awareness of the risks and opportunities related to AI, facilitating knowledge sharing, and educating actuaries.
   - Promote the role of the actuary in existing and emerging wider fields and raise its profile.
   - Prepare the IAA, as the voice of the global actuarial profession, to proactively engage with Supranational organizations on AI-related risks and provide actuarial perspectives in their own related initiatives.

4. ***How will we reach this objective?***

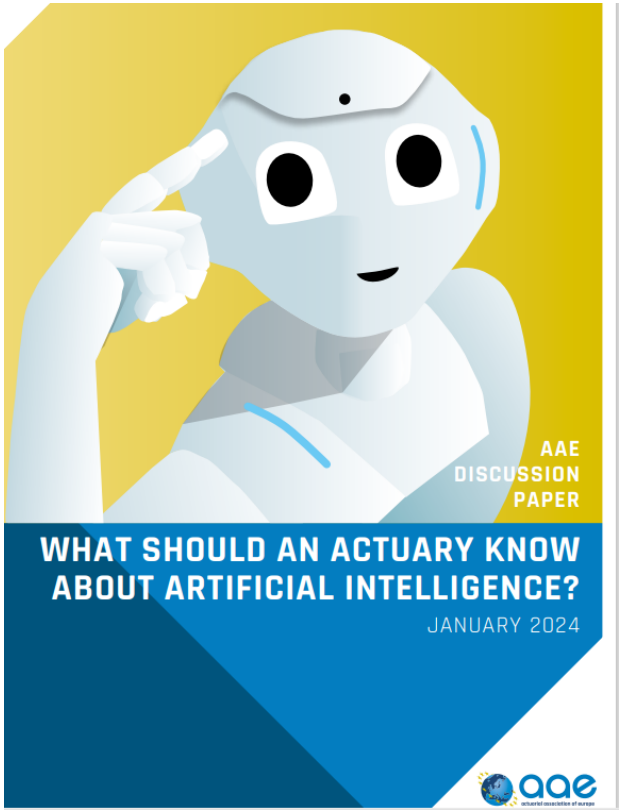
   - Establish the AI Task Force (AITF) to consider the following.
     - Engage with Full Member Associations (FMAs) and their regional bodies on this topic.
     - Scan the AI environment relevant to actuaries, create awareness, and support the education of actuaries in this field.
     - Address professionalism aspects of AI as it impacts actuaries.

Artificial Intelligence – International Actuarial Association

IAA AITF: PHASE 1 2024 (PROFESSIONALISM)

Principles across codes of conduct (ISAP1)

- Principle of integrity
- Speaking up
- Compliance
- Competence and care / knowledge and expertise
- Impartiality / objectivity
- Standards of practice
- Communication / control of work product



What-should-an-actuary-know-about-Artificial-Intelligence.pdf

IAA AITF: PHASE 1 2024 (EDUCATION)

Topics with strong support FMA sample survey

Narrow AI / Predictive AI

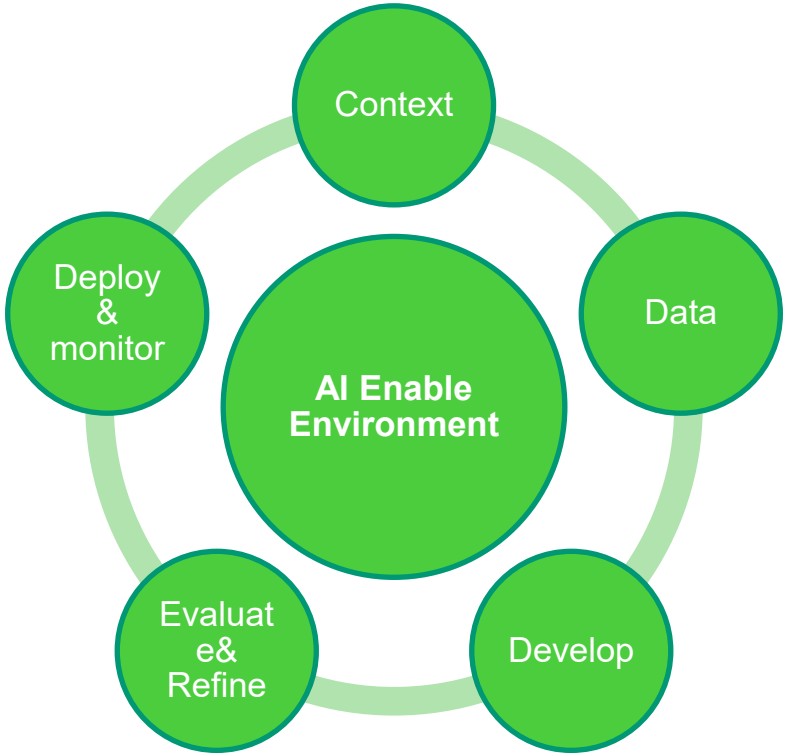
- Data engineering
- Model development / explainability
- Validation, auditing / testing
- Model governance & testing
- Communication (technical / non-technical stakeholders)

GenAI

- FEAT principles / bias
- Model governance

IAA AITF: PHASE 1 2024 (CROA)

Modernising the Actuarial Control Cycle



See: https://actuaries.org/app/uploads/2025/05/AITF2024_C5_ModelValidation_narrow-ai-models_DRAFT.pdf

IAA AITF: PHASE 1 2024 (GOVERNANCE)

Governance of Models (ISAP 1A): incremental AI disclosures

- Model risk and limitations
- Data privacy
- Data security
- Ethical considerations
- Legal considerations
- Reliance on other data models
- Outcomes of key function activities
- Reference and resources (transparency)

FSB FINANCIAL STABILITY BOARD

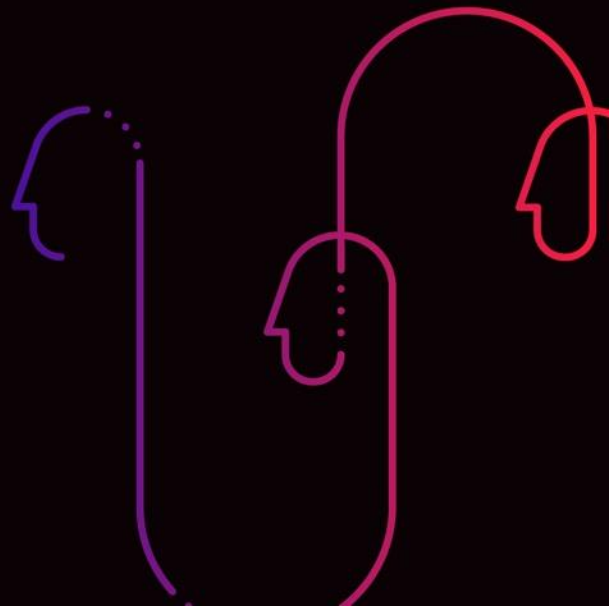
Monitoring Adoption of Artificial Intelligence and Related Vulnerabilities in the Financial Sector

10 October 2025

Source: https://www.fsb.org/uploads/P101025.pdf

AI USE CASES

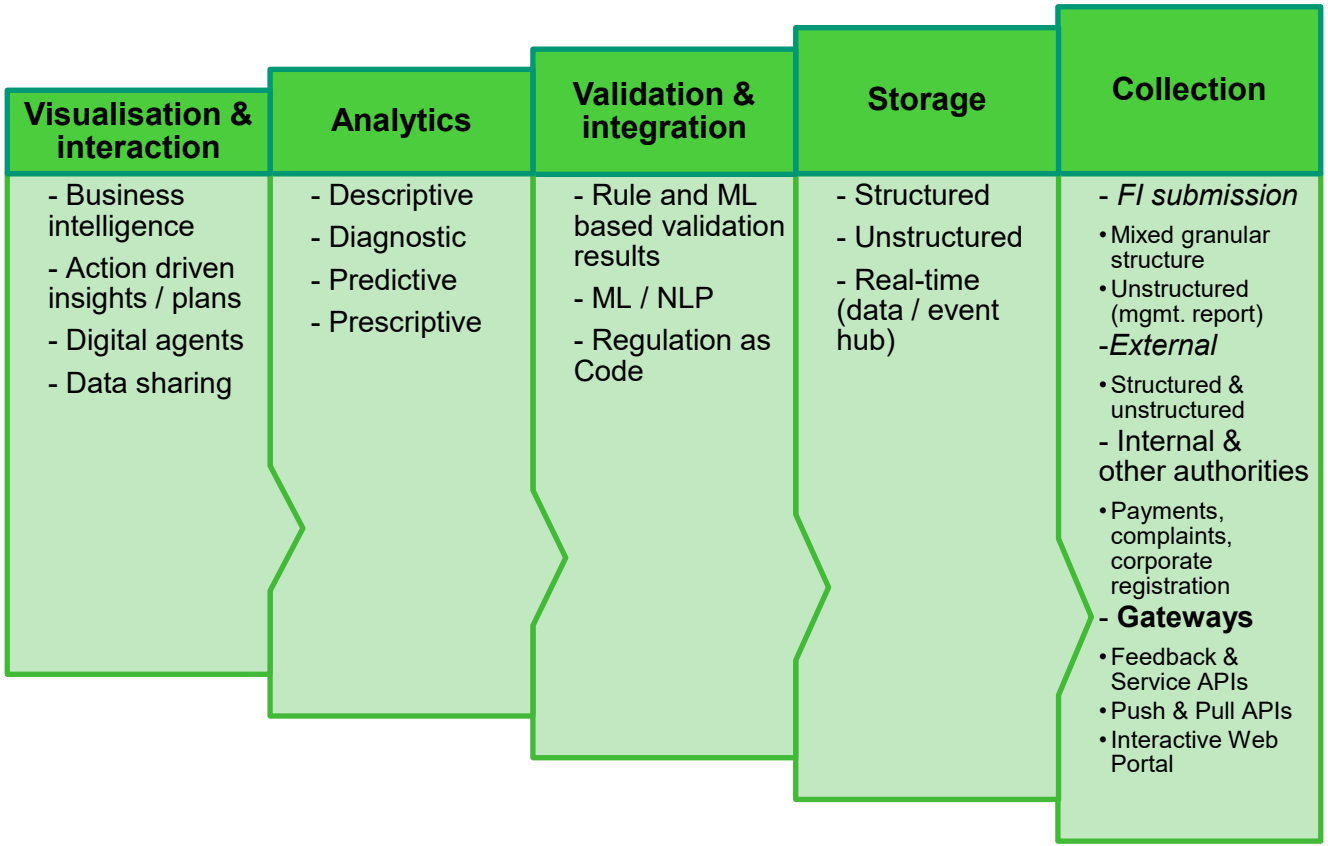
Diverse range of applications



USE CASE:

MEA REGULATOR SUPTECH

USE CASE: SUPTECH – TARGET STATE PILLARS



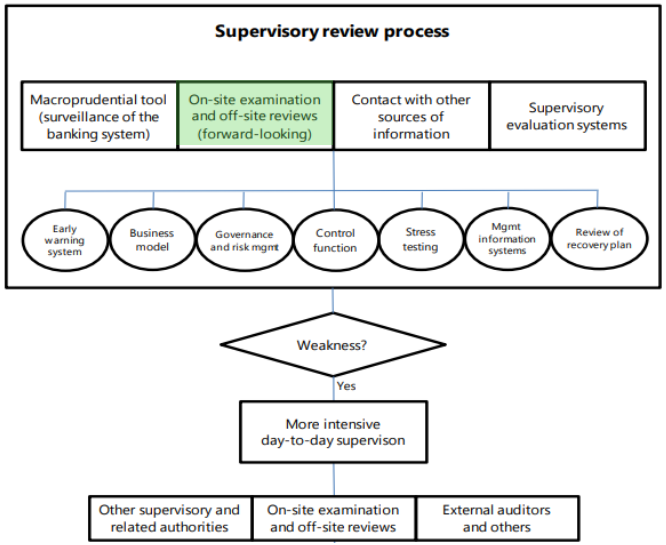
USE CASE: CAPABILITY& CHARACTERISTICS

- **Prudential Supervision**: Continuous assessment of risks of licensed FIs
- **Financial Stability**: Identification vulnerabilities & risk financial system (ie CyCB)
- **Conduct Supervision**: Ensure business is conducted in an orderly and transparent manner
- **Financial Consumer Protection**: Monitor, track, resolve complaints prevent financial misconduct
- **Financial Crime**: Adherence to AML/CFT legal & regulatory framework
- **Research & Statistics**: Dissemination of statistical insights to various stakeholders
- **Enforcement**: Impose enforcement actions against non-complaint financial institutions and individuals to ensure swift resolution

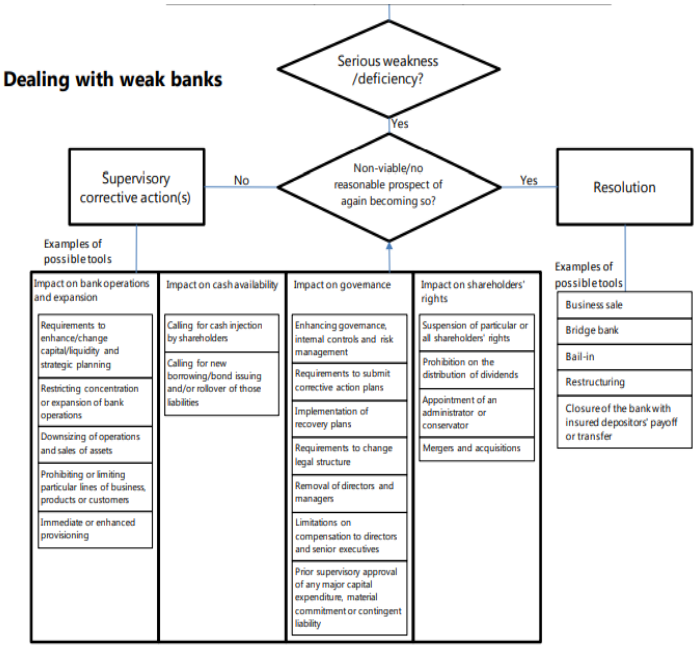
USE CASE: PRUDENTIAL SUPERVISION

Identifying & **Dealing** with weak banks

I. Identifying weak banks



II. Dealing with weak banks



Source: https://www.bis.org/bcbs/publ/d330.pdf

USE CASE: PRUDENTIAL SUPERVISION

Onsite-Examination Capability Map

1. Examination planning & Workflow management

2. Pre-Examination analysis

3. Communication

4. Evidence management & analysis

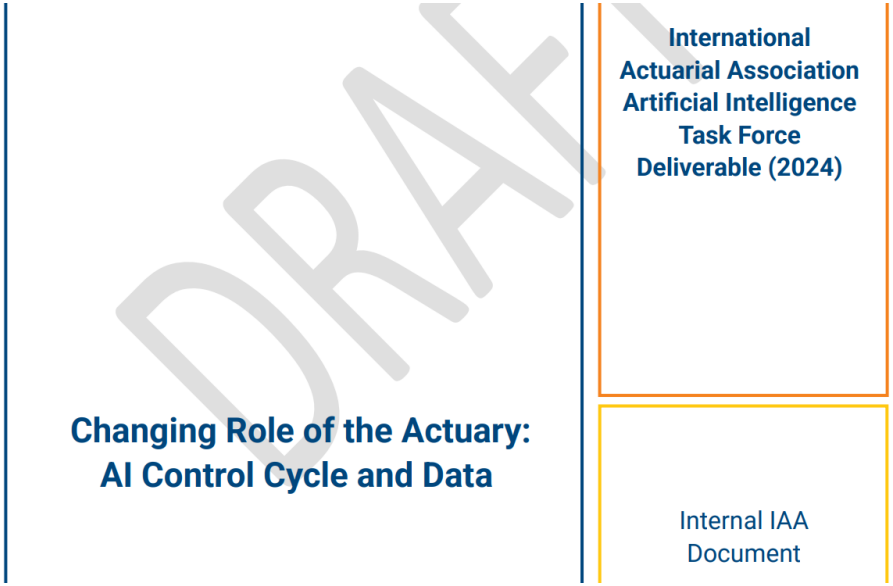
5. Onsite examination process

6. Administrative functionality

USE CASE:
DATA MANAGEMENT

USE CASE: DATA MANAGEMENT

Changing Role of Actuary – Data



Changing Role of the Actuary: AI Control Cycle and Data

This document was prepared by the Changing Role of Actuary workstream of the Artificial Intelligence Task Force (AITF) of the International Actuarial Association (IAA). The AITF was established to implement the Statement of Intent for IAA Activities on Artificial Intelligence, as adopted by the IAA Council on 8 March 2024.

Please note the following:

- This document is currently a draft and may be adjusted and/or combined with other documents and has not been subject to the formal due process required for it to be considered an official publication of the IAA.
- This document is intended to encourage understanding and debate of the issues raised therein. It is not an International Standard of Actuarial Practice (ISAP), nor does it set standards or requirements which any individual or organization is expected to consider or observe, or with which they are expected to comply. This is the case notwithstanding any language in the paper which, but for this clause, might suggest otherwise. This statement takes precedence over any such wording.
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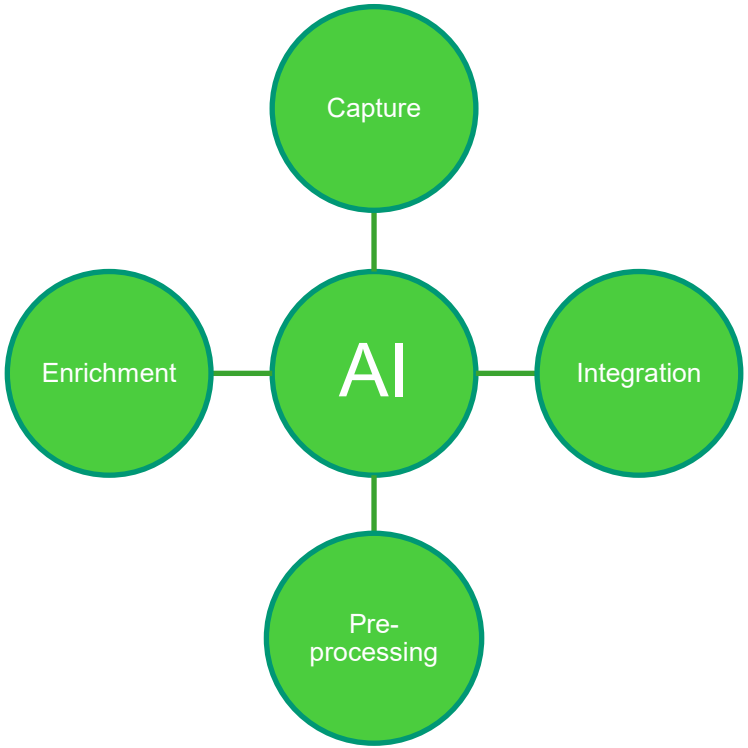
Source: https://actuaries.org/app/uploads/2025/05/AITF2024_C2_Data-and-control-cycle_DRAFT.pdf

USE CASE: DATA MANAGEMENT

Changing Role of Actuary – Data Life Cycle



USE CASE: DATA LIFE CYCLE

Data Capture

- Automating unstructured data integration
- Database design (leverage LLMs structure data)
- Data structure documentation (Mermaid –visualize database schema)
- Use Cases explored
    - Summarise lengthy and complex Reinsurance contracts
    - OCI: extraction of information (Python-based library EasyOCR)
    - LLM DB design: Insurance company case study

USE CASE: DATA LIFE CYCLE

Data Ingestion

- Uploading, structuring and documenting policy & claims details
- Automating Excel data integration with LLM generated code
- Use Cases explored
    - Automating data extraction from multiple insurance files

USE CASE: DATA LIFE CYCLE

Preprocessing

- Data validation, quality assessment and Exploratory Data Analysis (EDA)
- Comparing policy information and ensuring document consistency
- Claims management processing
    - {Standardisation, inconsistency detection, detection of recovery or litigation potential, sentiment and urgency analysis}
- Use Cases explored
        - Implementing LLM-based data validation for insurance records
        - Parsing claims descriptions
        - Extract information from accident reports

USE CASE: DATA LIFE CYCLE

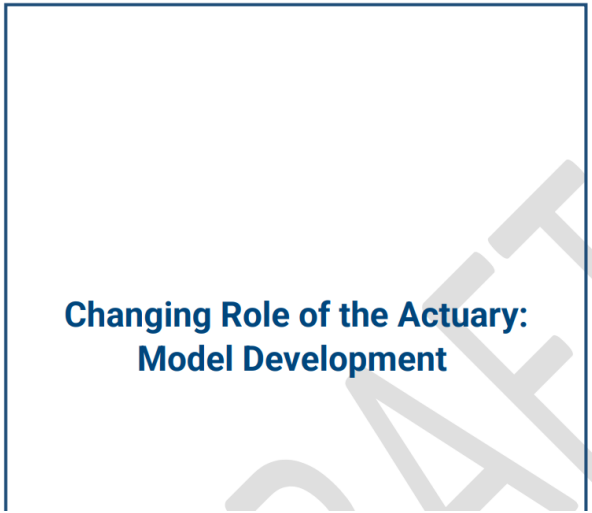
Enrichment

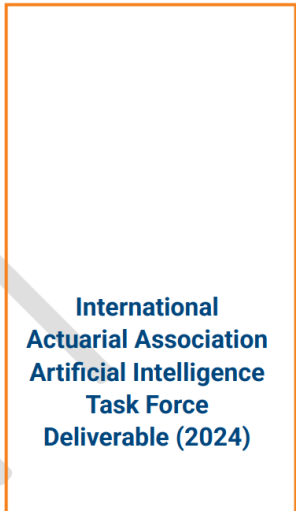
- Customer segmentation (active learning / fair active learning)
- Fraudulent claims
- Identifying and managing emerging risks
- Enhancing commercial risk underwriting
- Enhancing property risk assessments
- Use Cases explored
    - Use English accident reports to identify bodily injury
    - Sentence similarity

USE CASE
PROMPT ENGINEERING

USE CASE: PROMPT ENGINEERING

Changing Role of Actuary – Model Development (deliverable)





Changing Role of the Actuary
Model Development

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For any questions or comments, please contact us at: aitf.comments@actuaries.org

Source: https://actuaries.org/app/uploads/2025/05/AITF2024_C3_model_development_DRAFT.pdf

USE CASE: PROMPT ENGINEERING

What is Prompt Engineering?

1. Define the '**Prompt**' at a minimum, outlining
   - ***Objectives***: Clear definition of objectives and intention of the model. Identify the specific outcomes needed from the AI system.
   - ***Instructions***: Articulation of a step-by-step set of instructions on how to perform the tasks underlying the objectives
   - ***Additional considerations***: Enhance the prompt by addressing aspects such as persona (ie role of consumer), constraints (ie word limitations / rules), tone (ie formal / casual), context (ie background information) examples, reasoning steps, desired response format, recap requirements and safeguards to mitigate risks
2. **Assess the model's capabilities and limitations**: recognise how language models interpret and respond to prompts
3. **Iterate and refine**: Continuously test and adjust prompts to optimise performance.

USE CASE: PROMPT ENGINEERING

Sample ‘Prompt’ types & illustrative use cases

- ***Informational prompts***: designed to extract specific information or insights (e.g “What are the key drivers of risk in this dataset?”)
- ***Generative prompts***: used to create content, such as reports, explanations or scenarios (ie “Draft a risk assessment report based on the following data…”)
- ***Analytical prompts***: focused on analysing data, identifying trends, or performing calculations (ie “Summarise trends in *claims data* over the past five years…”)
- ***Exploratory prompts***: designed for open ended brainstorming or idea generation (in contrast with the content focused output generative prompts), encouraging creative exploration without required fully formed outputs (ie “Suggest strategies to address emerging risks in health insurance.”)

USE CASE: PROMPT ENGINEERING

Developing the skillset for Actuaries

- Building foundational knowledge
- Practicing prompt crafting
- Leveraging feedbacks and metrics
- Collaborative learning opportunities (within / across professions)
- Integrating prompt engineering into CPD
- Cultivating a growth mindset

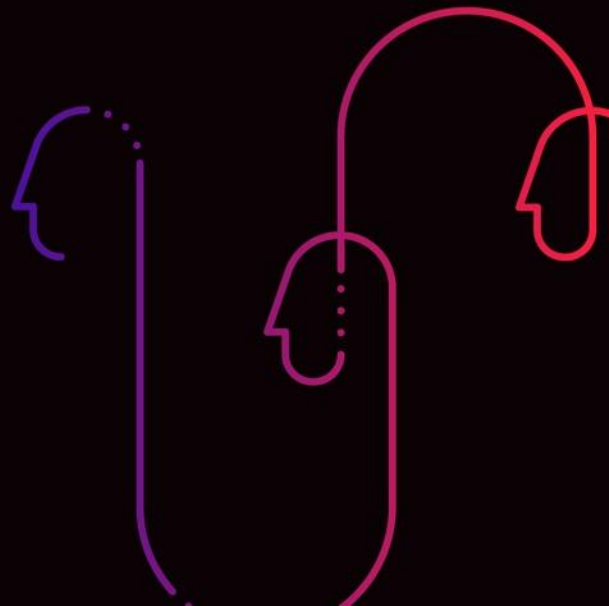
USE CASE: PROMPT ENGINEERING

Prompt Engineering: Use Cases explored

- Regulatory compliance
- Claims reserving
- Underwriting risk assessment
- Fraud detection

NEXT STEPS

Path to The Optimised Actuary



NEXT STEPS

Securing the vision for the Actuarial profession

- Collaboration: Industry / Academia / Regulatory Bodies
- Professionalism: integrity & ethics, governance
- Education: modernisation, life-long learning
- Innovation: experimentation & operational efficiency