

HKMA GenA.I. Sandbox – Fraud Investigation Automation

1. Overview: Embracing fraud investigation with Generative Artificial Intelligence

Hang Seng Bank (Hang Seng) is keen on adopting Generative Artificial Intelligence (GenA.I.) to uplift fraud investigation efficiency and accuracy.

As inaugural participant of the first cohort of GenA.I. Sandbox, an initiative by the Hong Kong Monetary Authority (HKMA) in collaboration with the Hong Kong Cyberport Management Company Limited (Cyberport), Hang Seng has utilised provided computational power, and conducted the Proof-of-Concept (PoC) Experiment for fraud investigation automation (the "PoC Experiment")*.

* Synthetic data without real personally identifiable information (PII) was used in this PoC Experiment.

Use Case: Assisting Fraud Investigation



Objectives

- Exploring feasibility of training¹ and deploying Large Language Model (LLM) GenA.I. in on-premises environment to support fraud investigation report generation



Pain points addressed

- Manage fast-growing fraud volume and complexity with finite resources
- Require extensive manual efforts for information extraction and report preparation
- Require the highest data protection standard for sensitive PII, transaction records, and legal documents



Goals

- To uplift fraud investigation operations efficiency by reducing manual efforts
- To fulfil compliance and regulation requirements by maximising data privacy and security protection in GenA.I. usage

2. Use case design and benefits

The PoC Experiment showcased that GenA.I. could increase automation to fraud investigation report generation.

Tasks	Current Pain Points	GenA.I.-assisted Process
Information extraction and analysis ²	Manual	Automated (contextual understandings with LLM GenA.I.)
Data validation	Manual	Manual (data checker on GenA.I. outputs – human-in-the-loop)
Report writing	Manual	Automated (Template-based or GenA.I.)

Potential benefits

Financial Institutions	• Reduced investigation and reporting lead time • Increased fraud investigation capacities
Customers	• Better protection to customers
Society	• Faster suspect identification and reaction time to remedial action • Shorter gaming period of fraudsters

¹ Fine-tuning is a GenA.I. training methodology by modifying the model's internal weights according to provided data

² This PoC Experiment focused on information extraction and analysis, with template-based report generation automation

3. Key findings and learnings

What did the PoC Experiment tell us?

Development strategy	Maximising GenA.I. accuracy (hallucinations minimisation) • Breaking down complex use case into small sub-tasks • Applying parameter-efficient fine-tuning³ for LLM model training • Enforcing structured output format⁴ • Evaluating with explainable metrics⁵
Results	90+% extracted information matched with reference (based on evaluation results of synthetic testing cases)

We acknowledge GenA.I. adoption as a collaborative approach with users:

- GenA.I. simplifies fraud investigation process journey by automating information extraction and analysis.
- The occurrence of GenA.I. errors (hallucinations) poses a main challenge to adoption, hindering initial output quality.
- GenA.I. serves as complement to manual validation (human-in-the-loop) to mitigate hallucination, maintaining human-level accuracy while reducing processing time.

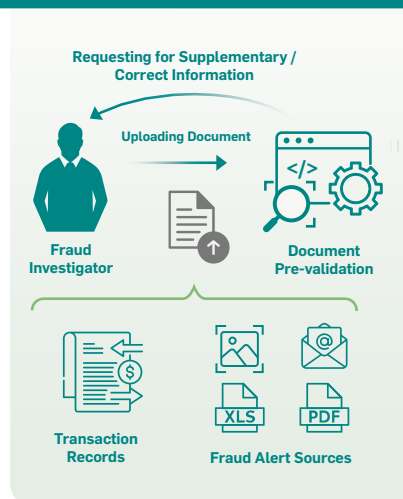
We identify key drivers for future success of GenA.I. use cases:

- Data privacy and security protection are one of the top priority concerns for GenA.I. adoption.
- Sufficient volume of high-quality training data, coupled with clear business logics is crucial for effective GenA.I. system functionality.
- User-friendly interface with interactive visualisation facilitates human-in-the-loop leading to high-quality GenA.I. output.
- Cross-functional collaboration between business and technology teams is essential for continuous performance monitoring and business objectives alignment throughout GenA.I. project lifecycle.

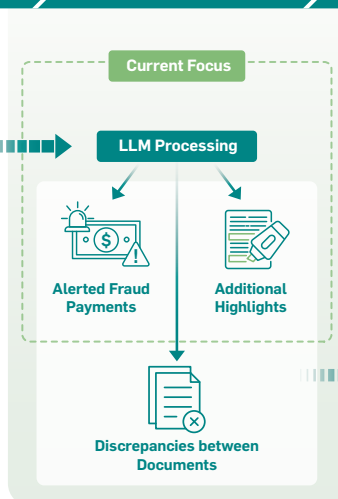
Next Steps

- We are optimistic that continuous advancements of GenA.I. capabilities gradually relieve strains associated with fraud investigations.
- We will use this PoC Experiment as a benchmark to work out future plans for refining and deployment on-premises models.

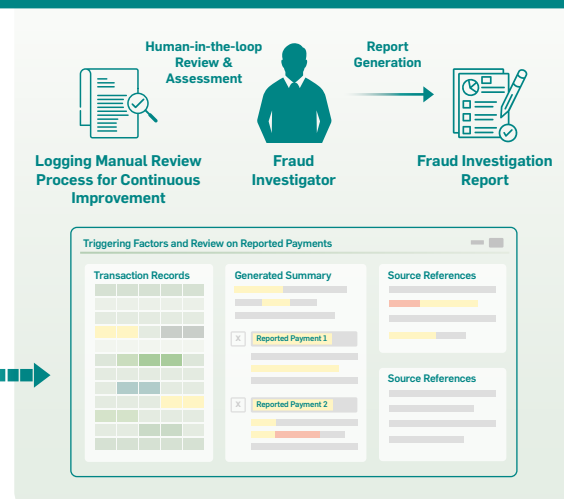
Document Ingestion & Pre-validation



LLM Workflow



Human-in-the-loop Review & Report Generation



3 Low-Rank Adaptation (LoRA) as efficient fine-tuning methodology

4 Structured output format with JavaScript Object Notation (JSON)

5 String matching as evaluation metric

Disclaimer

This summary is produced by Hang Seng Bank Limited ("Hang Seng") for the HKMA GenA.I. Sandbox PoC Experiment (the "Experiment"). It is important to recognise that Hang Seng's results and findings from the Experiment presented in this summary should be interpreted within the context of the experiments which was conducted using synthetic data/cases, and the limitations of the experimental scale and variety of data available. Despite these limitations, the results and findings are intended to support ongoing discussions and experimentation around GenA.I.. All contents of this summary (including any views, insights and learning experience expressed in it) are provided "as is" intended for informational, educational and demonstration purposes only and do not reflect Hang Seng's policy stance on GenA.I. implementation in Hong Kong. Hang Seng makes no representation or warranty, express or implied, that the contents in this summary are fit for purpose, timely, correct, accurate, complete or non-infringing. Hang Seng does not accept any responsibility or liability with respect to the use of or reliance on any contents or information contained in this summary, to the extent permitted by all applicable laws. All contents of this summary are owned by or licensed to Hang Seng, and are protected by copyright and other applicable intellectual property rights, and may not be used, published, transmitted, broadcasted, copied, reproduced or distributed in whole or in part without the explicit written permission of Hang Seng.