MSR17

Agentic-AI analyser to chat with your Excel-Based Cost-Effectiveness Models

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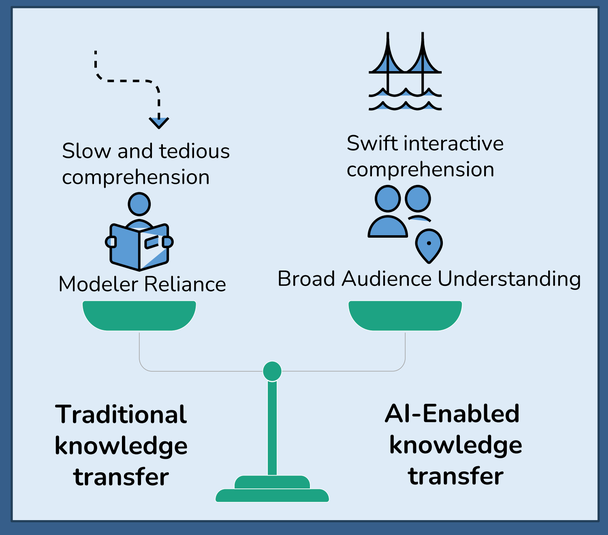
BACKGROUND

Excel-based cost-effectiveness models (CEMs) are central to health economic evaluations.[1] These models are often highly complex making comprehension and knowledge transfer (KT) difficult and tedious.

This work proposes an Agentic AI analyser chatbot to democratize access to these models

Hybrid Intelligence Framework behind the tool empowers humans to swiftly build comprehension over complex models with AI's lead.[2]

This tool further enables KT for country affiliates, internal team transitions, old model understanding and trainings.



OBJECTIVES



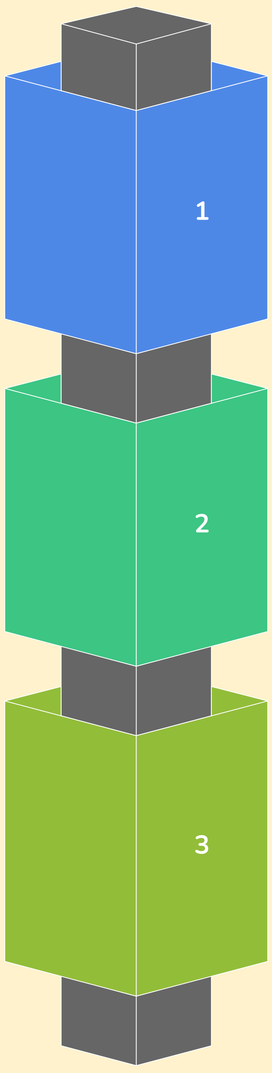
Agentic AI CEM analyzer chatbot
Develop an python based interactive agentic-AI Excel-based CEM analyzer chatbot

Parsing and restructuring complex Excel-based CEMs
Extract formulae, values, and cell addresses into interpretable logical groups.

Retrieving, summarizing, and explaining the model
Build reasoning layers to map fragmented Excel logic into coherent narratives.

Allowing users to query models in natural language
Allow users to query conversationally, reducing onboarding and KT effort.

METHODOLOGY



Excel Ingestion and Structuring

- Uploading Excel models, extracting
- Extracting cell addresses, values and formulae and storing in a structured database
- Sheet level summary generated by large language model (LLM) as part of reasoning later

Agentic Framework and Context Engineering

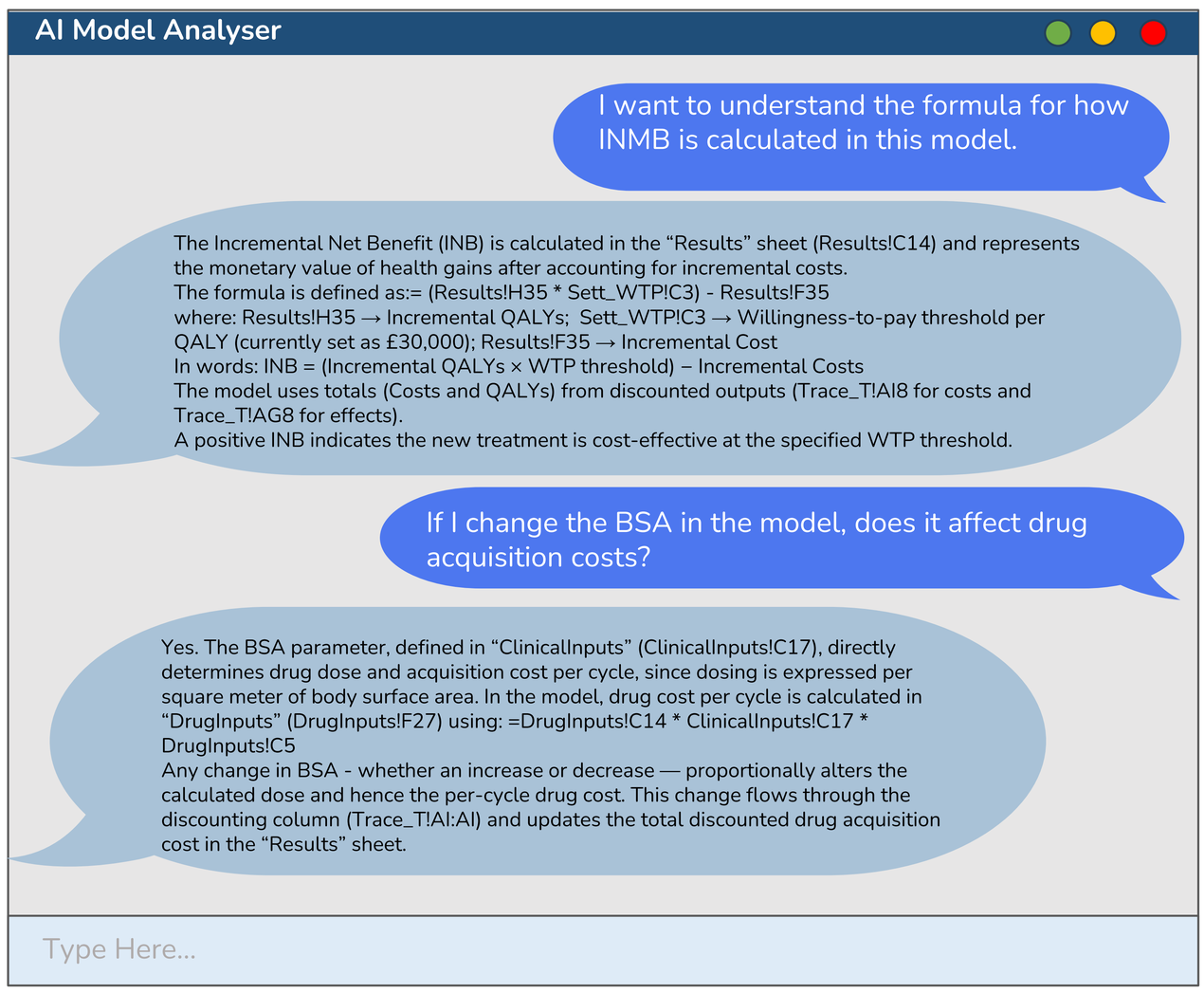
- Designing an agent with retrieval tools[3]
- System or user prompts set up with necessary context engineering
- Reasoning layer allowed the agent to identify trace linkages and draft coherent explanations.

Conversational Interaction and Retrieval

- Integrating a natural-language interface
- Queries were mapped to structured retrieval tasks
- Supplementary documents could be integrated via vector storage and knowledge graphs[4]

RESULTS

- The tool successfully generalized across different Excel-based CEMs (and further to other economic evaluation model types)
- Accurately identified elements such as:
  - ✓ **Structural assumptions** (e.g., cycle length, state transitions).
  - ✓ **Model settings**
  - ✓ **Complex model implementation logic**



CONCLUSION

- The AI analyser agent enables immersive interaction with complex CEMs
- It reduces reliance on manual cell-by-cell comprehension
- Natural language interaction makes model logic understandable to both technical and non-technical stakeholders

Opaque Models
Manual inspection limits understanding based on users' capabilities



Transparent Models
Accessible logic improves auditability and similar understanding across users

> "Agentic AI analyser chatbot can transform complex Excel CEMs into transparent, conversational tools improving accessibility, speeding up knowledge transfer, and empowering decision-makers in health technology assessment (HTA)."

REFERENCES

1. Drummond, MF., 2025
2. Srivastava, T., 2025
3. Masterman, T., 2024
4. Lewis, P., 2020

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