Developing a Large Language Model-Based Simulation for P&T Committees: Methodology and Inputs for Realistic Dynamics

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Background

- Pharmacy & Therapeutics (P&T) committees are between organizations, vital for the management of drug formularies. Decisions vary making the formulary decision-making process unpredictable.

Objective

- Our objective was to understand the potential of using a large language model (LLM) to simulate P&T discussions.

Methods

- Cencora's internal generative artificial intelligence (AI) platform created a P&T meeting simulation called Split. It allows custom personas and leverages a privately deployed instance of OpenAI's GPT-4o, a GPT-4 variant with quicker responses and more efficient output. For the P&T simulation, committee members varied in subject matter expertise, personal sensitivities, attitudes toward the pharmaceutical industry, and professional backgrounds. Each member was assigned a committee role, and an LLM translated these characteristics into virtual personas. The model facilitated discussion and members deliberated, cast their votes, and created a meeting summary with final recommendation based on majority consensus.

Results

- The LLM successfully followed instructions and created realistic discussions.
- There were 0 accounts where members spoke outside their areas of expertise.
- Members maintained personality attributes and offered perspectives matching designated traits.
- The committee chair proficiently summarized the meeting and concluded with recommendations aligned with the consensus.
- Of note, virtual personas had difficulty with productive discourse during disagreements.

Figure 1. Creating split personas

Figure 2. Building Split custom instruction

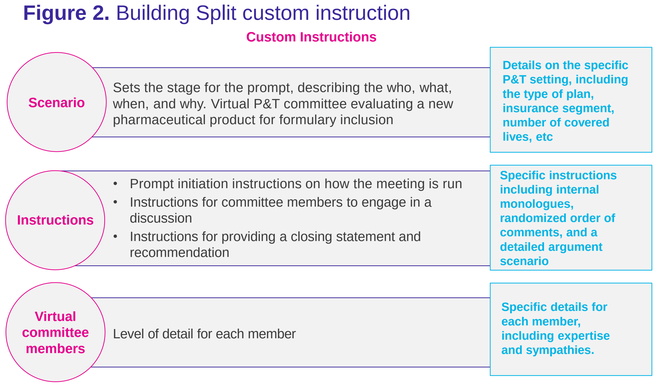

Figure 2. Outlines the general input structure used to program a generative AI platform for simulating realistic discussions similar to those of a P&T committee. It includes programming instruction themes essential for generating output comparable to Cencora's proprietary platform.

Figure 3. Conversation connectivity map

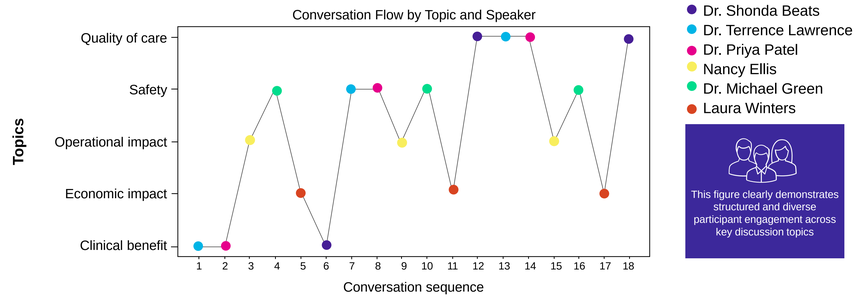

Figure 3. Illustrates the conversation flow across 5 main topics: Clinical benefit, economic impact, operational impact, safety, and quality of care. Each point on the graph represents a contribution from a speaker, with colors indicating the speaker's identity. The sequence of points along each line shows the progression of the discussion within each topic.

Figure 4. Split vs formal P&T committee meeting run time

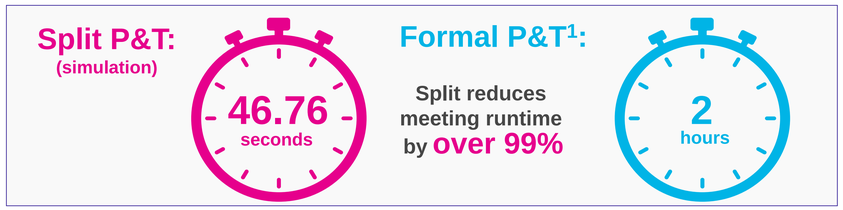

Figure 4. Illustrates the time it takes to run a P&T meeting using the simulation model, which includes the time to drop the dossier in the persona (46.76 seconds), against a formal P&T meeting, which has a meeting time on average of 2 hours (7,200 seconds).[1]

Figure 5. The boundless future possibilities of Split

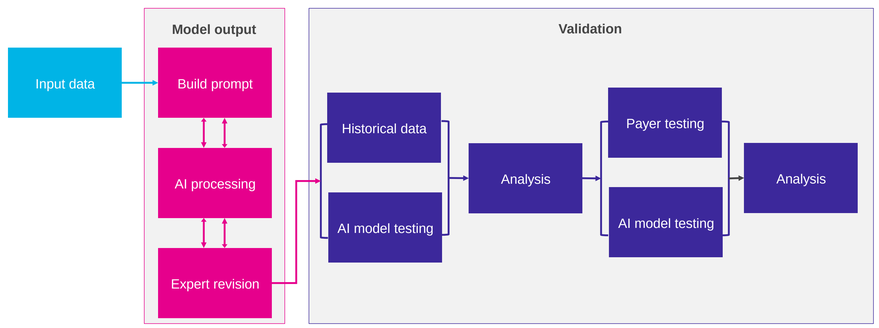

Figure 5. Highlights potential pathways for Cencora's split based on premier research. These pathways include establishing model validation by providing larger and more diverse datasets, as well as using feedback from payers to refine the model.

Limitations

- Limitations include issues inherent to generative AI platforms, including knowledge being limited to the programmers' input. Contributions were sometimes limited by subject matter expertise, and clinical subtleties were not consistently considered by all members.

Conclusions

- This study illustrates potential advantages of using LLM to simulate P&T committee discussions. Members consistently adhered to personality attributes, fostering diversity and reflecting realistic committee dynamics. Future work will focus on improving the model's coherence and expanding its ability to handle more complex documents.

Disclosures

- As stated herein, the evaluation was supported by Cencora's proprietary AI platform, which was used in accordance with Cencora's AI policies, and reviewed by a human.

References

1. Rodriguez R, Kelly BJ, Moody M. Evaluating the training, responsibilities, and practices of P&T committee members and nonmember contributors. *J Manag Care Spec Pharm*. 2017;23(8):868-874. doi:10.18553/jmcp.2017.23.8.868

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