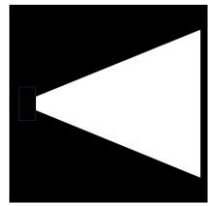


Mental Model Mismatch



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Overview

Why do some chatbot conversations feel seamless, while others fall flat? The answer often lies in mismatched mental models. Users bring expectations of how a system works, shaped by past experience. When those expectations clash with design, the result is frustration, confusion, and failure. This study explored what happens when dialog agents adapt, or fail to adapt, to these models.

Key Findings & Insights

Conflicting Expectations

Users held contradictory mental models: some thought chatbots only recognised keywords, others expected natural conversation. Some wanted quick answers, others expected step-by-step guidance. No single model dominated.

Success Hinges on Alignment

When mental models matched system behaviour, success rose sharply. When they clashed, conversations dragged, broke down, or lost trust.

Adaptive Agent Outperforms

An adaptive dialog agent reached a 77% success rate; better than FAQ-style bots (57%) or scripted bots (44%). It struck a middle ground in efficiency, averaging 7 turns per dialog (vs. FAQ too short, scripted too long).

Shaping, Not Shattering

Adaptive systems didn't radically change users' mental models. Instead, they flexed to fit expectations; even overcoming some negative assumptions. This alignment boosted usability and trust.



Why This Matters

Every mismatch between expectation and design is a missed opportunity. In workplaces, customer service, and everyday tools, failure to align with mental models means wasted time and lost trust. This study shows that adaptation—done subtly and implicitly; can rescue interactions, raising success and satisfaction.

Conclusion

Chatbots don't just need smarter answers. They need smarter alignment with how people think. By understanding and flexing to user mental models, adaptive agents can transform frustrating exchanges into efficient, successful conversations. The lesson: it's not just what the system knows, but how well it fits the human mind.

Vanderlyn, L., Văth, D., & Vu, N. T. (2024). *Investigating the effect of mental models in user interaction with an adaptive dialog agent*. arXiv preprint arXiv:2408.14154. <https://doi.org/10.48550/arXiv.2408.14154>