

AI Negotiator: Intelligent Chatbot for Seamless Negotiation

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Abstract

Autonomous negotiation systems, powered by artificial intelligence, are transforming supply chain management by optimizing supplier interactions. This paper proposes a framework for autonomous supplier negotiation using Statistical hypothesis testing to evaluate multiple negotiation strategies under uncertain conditions. Paper models supplier price negotiations with Random simulations, incorporating supplier cost variability and negotiation dynamics. Three strategies—distributive, integrative, and hybrid—are tested across diverse scenarios, with performance measured by negotiated price outcomes. Statistical hypothesis testing is applied to compare strategy effectiveness, identifying the hybrid approach as optimal for balancing cost savings and supplier relationships. The framework offers actionable insights into implementing autonomous negotiation systems in procurement as Agents negotiating with suppliers.

Keywords: Autonomous Negotiation, Chatbot, Supplier Management, Statistical Testing, Random Simulation, AI Agents