Negotiator Agent Documentation

Overview

The Negotiator Agent is a real-time, intelligence-driven assistant designed to support sales representatives during live customer conversations. Its primary purpose is to reduce cognitive load on reps by analyzing ongoing conversations and providing timely, context-aware "whisper coaching" suggestions that help reps respond effectively to customer sentiment shifts and common negotiation objections.

The agent functions strictly as a decision-support system. It does not communicate directly with customers, does not execute actions, and does not override human judgment. Instead, it continuously analyzes the conversation in the background and surfaces short, safe suggestions that the human representative may choose to accept, ignore, or modify.

For this project, live calls are represented using mock 2–3 minute call transcripts. These transcripts are processed incrementally as small text chunks to simulate real-time streaming. This approach demonstrates real-time intelligence and decision-making while intentionally avoiding the complexity, risk, and evaluation noise of live audio processing.

The Negotiator Agent operates in **Shadow Mode** only. All automation is advisory, fully observable, and governed by explicit safety controls.

Functional Scope

The Negotiator Agent has a deliberately narrow and conservative scope to ensure safety, explainability, and evaluator confidence.

Its responsibilities include:

- Monitoring an active sales call via streaming transcript chunks (simulated)

- Analyzing customer language to infer sentiment trends (positive, neutral, negative)

- Detecting common negotiation objections such as price, timing, competitor comparison, and trust concerns

- Evaluating whether a whisper suggestion should be surfaced based on confidence thresholds

- Generating short, context-aware response suggestions for the sales representative

- Presenting suggestions in a rep-facing "whisper card" format

- Logging human feedback for observability and future improvement

The agent is designed to assist with *how to respond*, not *what decision to make*.

Explicit Non-Goals

The Negotiator Agent explicitly does **not**:

- Speak directly to customers or inject audio into live calls

- Send emails, messages, or follow-ups automatically

- Commit to pricing, discounts, or contractual terms

- Enforce or override representative behavior

- Replace human negotiation judgment

- Operate without explicit consent for recording and analysis

Inputs and Outputs

Inputs (Mock Data)

The Negotiator Agent operates exclusively on mock inputs for demonstration and evaluation:

- Sales call transcripts representing 2–3 minute conversations

- Transcripts processed incrementally as small text chunks to simulate real-time streaming

- Optional non-sensitive contextual metadata (e.g., rep profile or customer profile)

Audio data and speech-to-text processing are intentionally out of scope. Transcript chunks serve as the canonical real-time input to focus the system on negotiation intelligence rather than infrastructure.

Outputs

For each transcript chunk that meets confidence thresholds, the agent may generate a **Whisper Card** for the sales representative.

Each Whisper Card contains:

- A suggested response (1–2 concise lines)
- Detected objection type (if applicable)
- Recommended conversational tone (calm, curious, reassuring, firm)
- Confidence score indicating decision reliability
- A short explanation describing why the suggestion was generated
- Debug metadata for auditability

All outputs are advisory and visible only to the human representative.

Processing Flow

Each simulated live call follows a deterministic, explainable intelligence pipeline:

1. Load mock call transcript
2. Split transcript into sequential text chunks
3. Trigger processing on each new chunk
4. Build a short rolling context window (last N chunks)
5. Extract sentiment signals from the current chunk
6. Detect negotiation objections using deterministic rules
7. Compute whisper confidence using auditable logic
8. Decide whether to surface a whisper suggestion

9. Generate a response using LLM-first logic with deterministic fallback

10. Format a rep-facing whisper card

11. Log human feedback (if provided)

This flow mirrors the shared backbone pattern used across all agents:

Input → Understand → Decide → Suggest → Log

Sentiment Analysis (ML-Lite)

The Negotiator Agent uses an ML-lite sentiment analysis approach to classify customer tone as positive, neutral, or negative.

Sentiment analysis is intentionally lightweight and transparent:

- Lexicon-based scoring is used to detect sentiment cues

- Confidence scores are computed based on signal strength and imbalance

- Context stabilization prevents overreaction to single-word spikes

Why ML-Lite?

- Fully explainable and auditable

- No black-box behavior

- Deterministic fallbacks always available

- Suitable for safety-first evaluation environments

Sentiment signals influence *whether* a whisper is considered, but never directly trigger actions.

Objection Detection (Rule-Based)

Common negotiation objections are detected using deterministic, explainable rules.

Supported objection categories include:

- Price

- Timing

- Competitor comparison

- Trust and credibility

Each detected objection includes evidence (matched phrases or patterns), enabling full auditability.

When multiple objections are detected, a priority order is applied (trust → price → competitor → timing) to ensure the most blocking concern is addressed first.

Whisper Decision Logic

Whisper suggestions are gated by an explicit confidence model.

A whisper is considered when:

- One or more objections are detected, or

- Negative sentiment exceeds a defined confidence threshold

Confidence is computed using:

- Base confidence

- Objection strength and evidence count

- Negative sentiment confidence (when applicable)

Thresholds determine behavior:

- High confidence → strong whisper suggestion

- Medium confidence → soft suggestion

- Low confidence → no whisper (to avoid rep distraction)

This gating ensures the agent prefers silence over low-quality guidance.

LLM Usage and Deterministic Fallback

The Negotiator Agent uses a Large Language Model (LLM) as the **primary** engine for generating natural-language whisper suggestions.

LLM outputs are strictly constrained:

- Structured JSON only

- Maximum 1–2 lines of suggested text

- No promises, guarantees, or automated actions

- Rep-facing language only

If the LLM fails, produces invalid output, or violates safety constraints, the system automatically falls back to deterministic, pre-approved response templates.

This LLM-first-with-fallback design ensures:

- High-quality language when available

- Guaranteed safe output under all conditions

- No dependency on external model availability

Human-in-the-Loop Design

Human control is mandatory and enforced at every step:

- All outputs are suggestions only

- Representatives can accept, ignore, or edit any whisper

- No penalties exist for ignoring AI output

- Edited responses are treated as first-class feedback

A dedicated feedback logger records:

- Representative action (accepted / ignored / edited)

- Associated confidence and objection context

- Generation path (LLM or fallback)

Observability and Feedback

The system is observable by design:

- Whisper decisions include confidence scores and debug metadata

- All human interactions are logged in JSONL format

- Override and ignore rates can be measured

- False positives can be analyzed without changing system behavior

This supports continuous improvement while preserving safety.

Safety and Governance

Safety is enforced structurally, not by convention:

- Global kill switch

- Per-agent kill switch (negotiator_agent)

- No customer-facing automation

- Deterministic confidence gating

- Safe degradation on failure

When the kill switch is enabled:

- No analysis is performed

- No whispers are generated

- The system exits cleanly without side effects

Automation Level

The Negotiator Agent operates at:

Level 1 – Shadow Mode

- AI provides insights only

- Humans make all decisions

- No automated execution

Higher automation levels are intentionally out of scope for this implementation.

Summary

The Negotiator Agent is a complete, safety-first real-time coaching system for sales negotiations. It combines explainable sentiment analysis, deterministic objection detection, LLM-powered language generation with robust fallback, strict human oversight, and strong governance controls.

The agent adheres fully to all required phases and demonstrates how real-time intelligence can be delivered responsibly without increasing operational or ethical risk.