PMM Messaging Engine — Technical Documentation

Comprehensive Architecture, Pipeline, and Prompt Reference

1. Executive Summary

The PMM Messaging Engine is a sophisticated content generation platform that converts practitioner pain points from community sources into scored, quality-tested messaging assets. It represents a paradigm shift from traditional "vendor-out" marketing content to an "outside-in" approach that starts with real practitioner pain discovered in developer communities.

Core Innovation

Unlike conventional marketing tools that begin with product features and work outward, the Messaging Engine's signature **Outside-In Pipeline** starts by mining real developer communities (Reddit, Hacker News, Stack Overflow, GitHub Issues) for genuine practitioner frustrations, then builds messaging that leads with empathy before introducing product solutions.

Key Capabilities

- **4 distinct generation pipelines** — Standard, Outside-In (signature), Adversarial, and Multi-Perspective
- **Sequential DAG architecture** — each pipeline step feeds the next, no "pick best" comparisons
- **Shared refinement loop** — all pipelines end with iterative score → destop → refine (up to 3x)
- **Multi-model AI strategy** leveraging 4 specialized AI models
- **5-dimension quality scoring** with automated gates and plateau detection
- **8 asset types** from battlecards to narratives
- **Voice profile system** with persona-specific quality thresholds
- **Live pipeline step streaming** via `emitPipeline()` events
- **Full traceability** from source community evidence to final asset

Tech Stack

Layer	Technology
Backend	Hono (REST API), TypeScript
Frontend	Vite + React + Tailwind CSS (10-page admin UI)
Database	SQLite + Drizzle ORM (14 tables, incl. `pipelinesteps` columns)
AI Models	Gemini Flash, Gemini Pro (default generator), Gemini Deep Research, Claude (opt-in)

2. System Architecture

System Architecture Overview

Architecture Overview

The system follows a 6-stage pipeline architecture:

```
Product Docs → Insight Extraction → Research → Generation → Quality → Output
```

Stage 1: Product Document Input

- Users upload product documentation (PDFs, text, markdown)
- Supports up to 200K characters of source material
- Documents are stored and versioned in SQLite

Stage 2: Insight Extraction (Gemini Flash)

- Parses raw product documentation into structured insights
- Extracts: capabilities, differentiators, personas, pain points, claims, technical details
- Output is a JSON schema used by all downstream stages

Stage 3: Research (Gemini Deep Research)

- **Community Deep Research**: Searches developer communities for real practitioner pain
- **Competitive Research**: Analyzes competitor landscape and positioning
- Community research runs first, then competitive research is informed by community findings

Stage 4: Content Generation (Gemini Pro default, Claude opt-in)

- Generates messaging assets using extracted insights + research
- Gemini Pro is the default generation model; Claude is available when explicitly selected
- Supports 8 asset types × multiple voice profiles
- 4 pipeline variants, all ending with the shared refinement loop

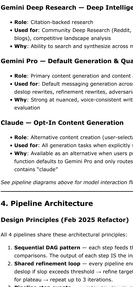
Stage 5: Quality Pipeline (Gemini Flash + Gemini Pro)

- 5-dimension parallel scoring
- Quality gates with per-voice thresholds
- Shared refinement loop: score → destop if needed → refine → check plateau (up to 3x)
- Destop processing to remove AI clichés

Stage 6: Asset Output & Storage

- Final assets stored with full traceability metadata
- Grounding validation strips fabricated quotes
- Workspace actions enable post-generation refinement

Infrastructure



3. Multi-Model AI Strategy

Multi-Model AI Strategy

The Messaging Engine uses a deliberate multi-model strategy where each AI model is selected for its specific strengths:

Gemini Flash — Speed Operations

- **Role**: Fast evaluations and scoring
- **Used for**: Product insight extraction, quality scoring (all 5 dimensions in parallel), quick evaluations
- **Why**: Low latency, high throughput, cost-effective for structured extraction tasks

Gemini Deep Research — Deep Intelligence

- **Role**: Citation-backed research
- **Used for**: Community Deep Research (Reddit, HN, SO, GitHub Issues, dev blogs), competitive landscape analysis
- **Why**: Ability to search and synthesize across multiple web sources with citations

Gemini Pro — Default Generation & Quality Control

- **Role**: Primary content generation and content analysis/rewriting
- **Used for**: Default messaging generation across all pipelines, step detection, destop rewrites, refinement rewrites, adversarial attack prompts
- **Why**: Strong at nuanced, voice-consistent writing and analytical language evaluation

Claude — Opt-In Content Generation

- **Role**: Alternative content creation (user-selectable per session)
- **Used for**: All generation tasks when explicitly selected instead of Gemini Pro
- **Why**: Available as an alternative when users prefer it. The `generateContent()` function defaults to Gemini Pro and only routes to Claude if the model name contains "claude".

See pipeline diagrams above for model interaction flows.

4. Pipeline Architecture

Design Principles (Feb 2025 Refactor)

All 4 pipelines share these architectural principles:

1. **Sequential DAG pattern** — each step feeds the next. No `pickBestResult()` comparisons. The output of each step IS the input to the next step.
2. **Shared refinement loop** — every pipeline ends with `refinementLoop()`: score → destop if slop exceeds threshold → refine targeting failing dimensions → check for plateau → repeat up to 3 iterations.
3. **Pipeline step events** — `emitPipeline()` writes progress to `generation_jobs.pipelinesteps` for live UI streaming. Steps include `extract-insights`, `research`, `generate`, `refine`, plus pipeline-specific steps like `pain-draft`, `attack-ri`, `defend-ri`, `synthesize`, etc.
4. **`generateAndScore()` is simple** — generates content and scores it. No inline refinement. Refinement is handled exclusively by `refinementLoop()`.

Removed in This Refactor

- **Split Research Pipeline** — removed entirely (was identical to Standard; both already run community → competitive research sequentially)
- **`pickBestResult()` pattern** — removed from all pipelines. Each pipeline follows a sequential DAG.
- **`generateAndScoreLean()`** — simplified to `generateAndScore()` with no inline refinement logic

All 4 Pipelines Compared

4.1 Standard Pipeline (PoV-First)

Standard Pipeline Flow

The product-narrative-first pipeline. Instead of leading with pain (that's Outside-In), Standard leads with the product's **point of view** — its thesis, contrarian take, and narrative arc. Community research validates the PoV rather than driving it.

Philosophy: "Here is our story — validate it against practitioner reality."

Sequential DAG:

```
Deep PoV Extraction → Community Validation → Competitive Research → Generate from YOUR Narrative → Refinement Loop → Store
```

Standard vs Outside-In Comparison

Aspect	Standard Pipeline	Outside-In Pipeline
Philosophy	"Here is our story — validate it"	"What is the community saying — build from that"
Step 0	Deep PoV Extraction (Gemini Pro)	Extract Insights (Gemini Flash)
Extraction	Thesis, contrarian take, narrative arc, strongest claims	Capabilities, differentiators, pain points
Community Research	Validation — confirms/challenges our PoV	Discovery — drives the narrative
Generation Prompt	PoV-first: leads with thesis and narrative arc	Pain-First: leads with practitioner frustration
System Prompt	"Lead with your point of view"	"Lead with the pain"
Content Voice	Opinionated, defensible argument	Empathetic, practitioner-resonant
Best For	Product launches, thought leadership, narratives	Battlecards, talk tracks, community-validated content

Step 0: Deep PoV Extraction

- **Model**: Gemini Pro (not Flash — needs deeper reasoning)
- **Input**: Raw product documentation (up to 200K chars)
- **Output**: `DeepPoVInsights` — extends `ExtractedInsights` with:
  - `thesis`: The product's core argument/opinion about the industry
  - `contrarianTake`: Where this disagrees with conventional wisdom
  - `narrativeArc`: { problem, insight, approach, outcome } — the product's story
  - `strongestClaims`: Array of { claim, evidence } — max 6, backed by docs
  - `painsSolved`: 2-3 sentence opinionated stance
- **Fallback**: If Deep PoV extraction fails, falls back to standard `extractInsights()` + Flash
- **Purpose**: Finds the NARRATIVE, not just features — what does this product BELIEVE?

Step 1: Community Validation

- **Model**: Gemini Deep Research
- **Input**: `formatInsightsForDiscovery(insights)` + optional user prompt
- **Purpose**: Validates the product's PoV against practitioner reality — does the thesis hold up? Do practitioners experience the problem as framed?
- **Output**: `EvidenceBundle` — same structure as before, but used for **validation** not discovery

Step 2: Competitive Research

- **Model**: Gemini Deep Research
- **Input**: `formatInsightsForResearch(insights)` + community findings
- **Output**: Competitive analysis that sharpens positioning
- **Key detail**: Community findings inform competitive analysis

Step 3: Generate from YOUR Narrative

- **Model**: Gemini Pro (default) or Claude (if user-selected)
- **Input**: `buildPoVFirstPrompt()` — leads with:
  1. Point of View (the opinionated stance)
  2. Thesis (the core argument)
  3. Contrarian Take (where we disagree with status quo)
  4. Narrative Arc (problem → insight → approach → outcome)
  5. Strongest Claims with evidence
  6. Full product intelligence
  7. Community evidence (for validation, NOT to change the narrative)
  8. Competitive context (to sharpen positioning)
- **System prompt**: "Lead with your point of view. The reader should encounter a clear, opinionated stance in the first two sentences."
- **Output**: One draft per (assetType × voiceProfile) combination

Step 4: Refinement Loop (up to 3 iterations)

- **Scoring model**: Gemini Flash — scores all 5 dimensions in parallel
- **Refinement model**: Gemini Pro — targeted rewrites for failing dimensions only
- **Deslop model**: Gemini Pro — removes AI clichés when slop score exceeds threshold
- **Input**: Generated draft + `formatInsightsForScoring(insights)` as scoring context
- **Termination**: Quality gates pass, OR plateau detected (no score improvement), OR 3 iterations reached

Step 5: Store

- **Grounding validation**: Strips fabricated practitioner quotes based on evidence level
- **Storage**: Asset + variant + traceability records in SQLite
- **Metadata**: Generation job ID, voice profile, fabrication-stripped flag, source counts

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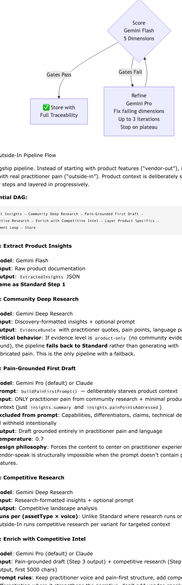
4.2 Outside-In Pipeline (Signature)



Outside-In Pipeline Flow

The flagship pipeline. Instead of starting with product features ("vendor-out"), it starts with real practitioner pain ("outside-in"). Product context is deliberately starved in early steps and layered in progressively.

Sequential DAG:

```
Extract Insights → Community Deep Research → Pain-Grounded First Draft →
Competitive Research → Enrich with Competitive Intel → Layer Product Specifics →
Refinement Loop → Store
```

Step 1: Extract Product Insights

- **Model**: Gemini Flash
- **Input**: Raw product documentation
- **Output**: `ExtractedInsights` JSON
- **Same as Standard Step 1**

Step 2: Community Deep Research

- **Model**: Gemini Deep Research
- **Input**: Discovery-formatted insights + optional prompt
- **Output**: `EvidenceBundle` with practitioner quotes, pain points, language patterns
- **Critical behavior**: If evidence level is `product-only` (no community evidence found), the pipeline **falls back to Standard** rather than generating with fabricated pain. This is the only pipeline with a fallback.

Step 3: Pain-Grounded First Draft

- **Model**: Gemini Pro (default) or Claude
- **Prompt**: `buildPainFirstPrompt()` — deliberately starves product context
- **Input**: ONLY practitioner pain from community research + minimal product context (just `insights.summary` and `insights.painPointsAddressed`)
- **Excluded from prompt**: Capabilities, differentiators, claims, technical details — all withheld intentionally
- **Output**: Draft grounded entirely in practitioner pain and language
- **Temperature**: 0.7
- **Design philosophy**: Forces the content to center on practitioner experience. Vendor-speak is structurally impossible when the prompt doesn't contain product features.

Step 4: Competitive Research

- **Model**: Gemini Deep Research
- **Input**: Research-formatted insights + optional prompt
- **Output**: Competitive landscape analysis
- **Runs per (assetType × voice)**: Unlike Standard where research runs once, Outside-In runs competitive research per variant for targeted context

Step 5: Enrich with Competitive Intel

- **Model**: Gemini Pro (default) or Claude
- **Input**: Pain-grounded draft (Step 3 output) + competitive research (Step 4 output, first 5000 chars)
- **Prompt rules**: Keep practitioner voice and pain-first structure, add competitive differentiation where it strengthens the narrative, don't add vendor-speak, highlight gaps competitors miss
- **Output**: Competitively-enriched draft that retains practitioner grounding
- **Temperature**: 0.5

Step 6: Layer Product Specifics

- **Model**: Gemini Pro (default) or Claude
- **Input**: Competitively-enriched draft (Step 5 output) + full product intelligence (`formatInsightsForPrompt`) + asset template
- **Prompt rules**: Add capabilities/metrics/claims naturally, don't turn it into a feature list, keep practitioner voice dominant, every product mention must answer "so what?" for the practitioner
- **Output**: Fully enriched draft with all three layers (pain → competitive → product)
- **Temperature**: 0.5

Step 7: Refinement Loop

- **Same as Standard Step 5** — shared `refinementLoop()` with scoring, deslop, plateau detection

Step 8: Store

- **Same as Standard Step 6** — grounding validation + full traceability

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4.3 Adversarial Pipeline

Adversarial Pipeline Flow

A stress-testing pipeline that subjects content to two rounds of hostile critique and defense. The output is battle-hardened — every remaining claim can withstand skeptical scrutiny.

Sequential DAG:

```
Extract Insights → Community Research → Competitive Research → Generate Draft →
Attack Round 1 → Defend Round 1 → Attack Round 2 → Defend Round 2 →
Refinement Loop → Store
```

Step 1: Extract Product Insights

- **Model**: Gemini Flash
- **Same as Standard Step 1**

Step 2: Community Research

- **Model**: Gemini Deep Research
- **Same as Standard Step 2** — community findings feed into competitive research

Step 3: Competitive Research

- **Model**: Gemini Deep Research
- **Same as Standard Step 3** — informed by community findings

Step 4: Generate Initial Draft

- **Model**: Gemini Pro (default) or Claude
- **Input**: Same as Standard — `buildUserPrompt()` with full research context, insights, templates
- **System prompt**: `buildSystemPrompt()` with voice guide and persona angle
- **Output**: Initial draft — this becomes the target for adversarial attack
- **Temperature**: 0.7

Step 5: Attack Round 1

- **Model**: Gemini Pro (always — not user-selectable, attacker needs consistent hostility)
- **Role**: "hostile, skeptical senior practitioner reviewing vendor messaging — burned by every vendor promise in the last decade"
- **Input**: The initial draft from Step 4
- **Attack vectors**:
  - **Unsubstantiated claims**: What claims have zero evidence? What proof would be needed?
  - **Vendor-speak detection**: Every phrase that sounds like marketing — quoted exactly
  - **Vague promises**: Where does it hand-wave? What details are missing?
  - **Reality check**: What would actually happen if a practitioner tried what this implies?
  - **Missing objections**: What obvious buyer objections aren't addressed?
  - **Credibility gaps**: Where does trust break down?
- **Output**: Numbered list of specific attacks with quoted evidence
- **Temperature**: 0.6

Step 6: Defend Round 1

- **Model**: Gemini Pro (default) or Claude
- **Input**: Current draft + attack critique from Step 5 + product intelligence (`formatInsightsForPrompt`)
- **Defense rules**:
  - For unsubstantiated claims: add evidence from product intelligence OR remove the claim entirely
  - For vendor-speak: replace with practitioner language
  - For vague promises: make concrete with specifics, or cut
  - Address the strongest objections directly — don't dodge
  - Keep same structure and format
- **Output**: Defended version — should feel battle-hardened
- **Temperature**: 0.5

Step 7: Attack Round 2

- **Model**: Gemini Pro
- **Input**: The defended version from Step 6 (not the original draft)
- **Same attack prompt and vectors as Step 5**
- **Purpose**: Finds weaknesses that survived the first defense. Second-pass attacks tend to find subtler issues — hedging language, implied claims, tone inconsistencies.

Step 8: Defend Round 2

- **Model**: Gemini Pro (default) or Claude
- **Input**: Round 1 defended draft + Round 2 attacks + product intelligence
- **Same defense rules as Step 6**
- **Output**: Twice-defended, battle-hardened draft — the final content before refinement

Step 9: Refinement Loop

- **Same as Standard Step 5** — shared `refinementLoop()`, up to 3 iterations
- **Note**: After 2 rounds of adversarial hardening, most content already passes quality gates. The refinement loop typically runs 0-1 iterations.

Step 10: Store

- **Same as Standard Step 6** — grounding validation + traceability

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4.4 Multi-Perspective Pipeline

Multi-Perspective Pipeline Flow

Generates content from 3 distinct angles in parallel, then synthesizes the strongest elements into a single cohesive draft. This is the only pipeline that retains a parallel generation step — by design.

Sequential DAG:

```
Extract Insights → Community Research → Competitive Research →
Generate 3 Perspectives (PARALLEL) → Synthesize → Refinement Loop → Store
```

Step 1: Extract Product Insights

- **Model**: Gemini Flash
- **Same as Standard Step 1**

Step 2: Community Research

- **Model**: Gemini Deep Research
- **Same as Standard Step 2**

Step 3: Competitive Research

- **Model**: Gemini Deep Research
- **Same as Standard Step 3** — runs in parallel with community research (this pipeline keeps parallel research since perspectives need both inputs simultaneously)

Step 4: Generate 3 Perspectives (in parallel)

- **Model**: Gemini Pro (default) or Claude — 3 parallel calls
- **Base input**: Same `buildUserPrompt()` as Standard, with full research context
- **Temperature**: 0.7 for all three

Perspective A — Practitioner Empathy: - Lead ENTIRELY with pain — reader should feel seen before seeing any product mention - Use their language, their frustrations, their 2am-on-call stories - Product comes last, almost as an afterthought - No exec-speak, no vision statements — just what's broken and how this fixes it

Perspective B — Competitive Positioning: - Lead with what current alternatives FAIL at - Reader should recognize specific frustrations with their current tool - Show what's different — not "better" (vendor-speak), but specifically what changes and why it matters for their workflow

Perspective C — Thought Leadership: - Lead with the industry's broken promise — the thing everyone was told would work but doesn't - Frame the problem as systemic, not just a tooling gap - Should read like an opinionated blog post by someone who's seen patterns across hundreds of teams

Step 5: Synthesize

- **Model**: Gemini Pro (default) or Claude
- **Input**: All 3 perspective drafts + asset template
- **Synthesis instructions**:
  - Take the most authentic pain language from Perspective A
  - Take the sharpest competitive positioning from Perspective B
  - Take the strongest narrative arc from Perspective C
  - Weave into a single cohesive piece — don't concatenate, synthesize
  - Result should feel like one voice, not three stitched together
- **Output**: Single synthesized draft combining the best of all three angles
- **Temperature**: 0.5
- **Key detail**: Individual perspectives are never scored or stored — only the synthesized output matters

Step 6: Refinement Loop

- **Same as Standard Step 5** — shared `refinementLoop()`, up to 3 iterations

Step 7: Store

- **Same as Standard Step 6** — grounding validation + traceability

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5. Shared Refinement Loop

All 4 pipelines call `refinementLoop()` after their core generation logic. This is the single quality improvement mechanism across the entire system.

Algorithm

```
 function refinementLoop(content, scoringContext, thresholds, voice, assetType, systemPrompt,
model, maxIterations=3):
    scores = scoreContent(content)

    for i in range(maxIterations):
        if checkGates(scores, thresholds):
            break  // Quality gates passed — done

        if scores.slopScore > thresholds.slopMax:
            content = deslop(content, scores.slopAnalysis)  // Remove AI clichés

        refinementPrompt = buildRefinementPrompt(content, scores, thresholds, voice, assetType)
        refined = generateContent(refinementPrompt, systemPrompt, model)
        newScores = scoreContent(refined)

        if totalQualityScore(newScores) <= totalQualityScore(scores):
            break  // Plateau — no improvement, stop

        content = refined
        scores = newScores
```

```
    return { content, scores, passesGates: checkGates(scores, thresholds) }
```

Key Behaviors

- **Plateau detection**: If a refined version scores equal or lower than the current version, iteration stops immediately. This prevents infinite loops and quality degradation.
- **Targeted refinement**: The refinement prompt only targets failing dimensions, preserving what already works.
- **Deslop integration**: Slop removal runs as a pre-step before refinement when slop score exceeds the threshold.
- **Max 3 iterations**: Hard cap prevents runaway costs. Most content converges within 1-2 iterations.

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6. Pipeline Step Events

Each pipeline emits granular step events via `emitPipelineStep()` for real-time UI progress tracking.

How It Works

1. When a step starts: `emitPipelineStep(jobId, 'step-name', 'running')`
2. When a step completes: `emitPipelineStep(jobId, 'step-name', 'complete', { draft?, scores? })`
3. Steps are stored as a JSON array in `generation_jobs.pipelineSteps`
4. Each step record includes: `step`, `status`, `startedAt`, `completedAt`, optional `draft` (first 2000 chars), optional `scores`

Step Names by Pipeline

Pipeline	Steps
Standard	`extract-insights`, `community-research`, `competitive-research`, `generate`, `refine-{type}-{voice}`
Outside-In	`extract-insights`, `community-research`, `pain-draft-{type}-{voice}`, `competitive-research-{type}-{voice}`, `enrich-competitive-{type}-{voice}`, `layer-product-{type}-{voice}`, `refine-{type}-{voice}`

Adversarial	`extract-insights`, `community-research`, `competitive-research`, `draft-{type}-{voice}`, `attack-r1-{type}-{voice}`, `defend-r1-{type}-{voice}`, `attack-r2-{type}-{voice}`, `defend-r2-{type}-{voice}`, `refine-{type}-{voice}`
Multi-Perspective	`extract-insights`, `research`, `perspectives-{type}-{voice}`, `synthesize-{type}-{voice}`, `refine-{type}-{voice}`

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7. Prompt Catalog

7.1 Product Insight Extraction

File: `insights.ts` | **Model**: Gemini Flash

Output Schema:

```
{
  "productCapabilities": ["string"],
  "keyDifferentiators": ["string"],
  "targetPersonas": [{ "name": "string", "role": "string", "painPoints": ["string"] }],
  "painPointsAddressed": ["string"],
  "claimsAndMetrics": ["string"],
  "technicalDetails": ["string"],
  "summary": "string",
  "domain": "string",
  "category": "string",
  "productType": "string"
}
```

7.2 Community Deep Research

Model: Gemini Deep Research

Search Targets: Reddit, Hacker News, Stack Overflow, GitHub Issues, developer blogs

Output: Practitioner quotes with source URLs, common pain points, language patterns, evidence level classification (`strong` / `partial` / `product-only`).

7.3 Competitive Research

Model: Gemini Deep Research

Research Questions: Competitor landscape, market positioning, practitioner pain points with competitors, competitive gaps, market trends.

7.4 System Prompt — `buildSystemPrompt()`

Primary Directive: "Lead with the pain"

Persona-Specific Angles: | Persona | Focus | |———|——-| | `practitioner-community` | Dev-to-dev authenticity, on-call credibility | | `sales-enablement` | Objection handling, whiteboard-session coaching | | `product-launch` | Broken-promise narrative, bold before/after contrast | | `field-marketing` | 30-second attention test, scannable progressive understanding |

Banned Words: industry-leading, best-in-class, next-generation, cutting-edge, revolutionary, game-changing, seamless, robust, leverage, synergy, paradigm, holistic, end-to-end, world-class, mission-critical, bleeding-edge, state-of-the-art, turnkey, best-of-breed, enterprise-grade

Evidence Grounding Rules: Vary by `evidenceLevel` — `product-only` mode explicitly forbids fabricated practitioner quotes and requires `[Needs community validation]` markers.

7.5 Pain-First Prompt — `buildPainFirstPrompt()` (Outside-In)

Deliberately starves the prompt of product details: - **Included**: Practitioner pain from community research, product summary, pain points addressed - **Excluded**: Capabilities, differentiators, claims, technical details - **Design philosophy**: Forces content to center on practitioner experience. Product context is layered in later steps.

7.6 Adversarial Attack Prompt

Role: "hostile, skeptical senior practitioner reviewing vendor messaging"

Attack Vectors: Unsubstantiated claims, vendor-speak detection, vague promises, reality check, missing objections, credibility gaps.

7.7 Refinement Prompt — `buildRefinementPrompt()`

Targets only failing dimensions with specific scores and thresholds. Rules: fix only flagged issues, keep existing structure, don't introduce new slop, preserve practitioner voice.

7.8 Quality Scoring Prompts

Five parallel scoring dimensions:

Dimension	Scale	Good Direction	What It Measures

Slop	0-10	Lower = better	AI-typical clichés, filler, generic language
Vendor-Speak	0-10	Lower = better	Self-congratulatory vendor language
Authenticity	0-10	Higher = better	Whether it sounds genuinely human-written
Specificity	0-10	Higher = better	Concrete details vs. vague generalities
Persona-Fit	0-10	Higher = better	Resonance with target persona

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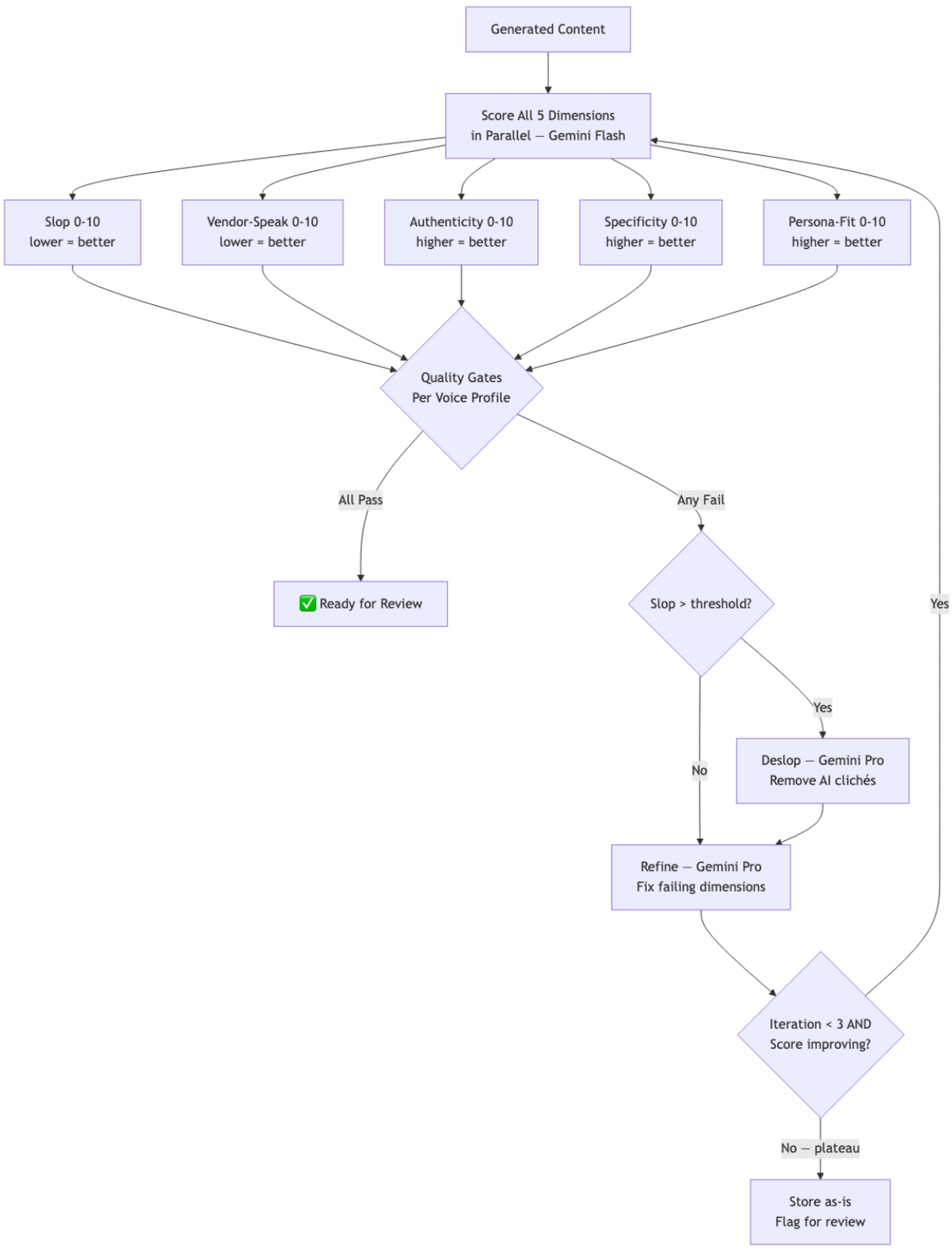
8. Quality Pipeline



Quality Pipeline

Scoring Architecture

All 5 quality dimensions are scored **in parallel** using Gemini Flash. Each dimension returns a numeric score (0-10), detailed textual feedback, and specific examples from the content.

Quality Gates

Defined **per voice profile**:

```
// Dev Advocate voice — strict on authenticity and vendor-speak
{ slopMax: 3, vendorSpeakMax: 2, authenticityMin: 7, specificityMin: 6, personaMin: 7 }

// Enterprise Marketing voice — more tolerant of vendor language
{ slopMax: 4, vendorSpeakMax: 4, authenticityMin: 5, specificityMin: 5, personaMin: 6 }
```

Deslop Process

1. **Detection**: Gemini Pro analyzes content for AI-typical language patterns
2. **Rewrite**: Replaces identified patterns with natural alternatives
3. **Preservation**: Maintains meaning, structure, and key messages

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9. Workspace Actions Reference

Post-generation refinement actions available in the admin UI:

Action	Description	AI Models Used
Deslop	Remove AI clichés from the active version	Gemini Pro
Regenerate	Full regeneration with voice + template + competitive research	Gemini Pro (or Claude) + Flash + Deep Research
Voice Change	Rewrite in a different voice profile	Gemini Pro (or Claude)
Adversarial Loop	2 rounds of attack/defend; elevation mode if already passing	Gemini Pro (or Claude)
Competitive Deep Dive	Deep Research for competitors + enrich content	Deep Research + Gemini Pro (or Claude)
Community Check	Deep Research for practitioner evidence + rewrite grounded in findings	Deep Research + Gemini Pro (or Claude)
Multi-Perspective	Generate 3 angles → synthesize → refine	Gemini Pro (or Claude) + Flash

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10. Asset Types Reference

Asset Type	Description	Typical Length	Primary Use Case
battlecard	Competitive comparison document	1-2 pages	Sales teams facing competitive deals
talk_track	Conversational script for sales calls	500-1000 words	SDR/AE phone conversations
launch_messaging	Product launch positioning document	1-2 pages	Product marketing launches
social_hook	Social media post with hook	100-280 chars	LinkedIn, Twitter, community posts
one_pager	Single-page overview document	1 page	Leave-behind, executive summary
email_copy	Email content for campaigns/ outreach	200-500 words	Nurture campaigns, outbound
messaging_template	Comprehensive messaging positioning (3000-5000 words)	3-5 pages	Brand consistency, team enablement
narrative	Long-form story-driven content with 3 length variants	1-3 pages	Blog posts, thought leadership

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11. Voice Profile System

Persona Angles

Angle	Focus	Tone
`practitioner-community`	Dev-to-dev authenticity	Peer, technical, honest
`sales-enablement`	Objection handling	Confident, specific, prepared
`product-launch`	Market impact	Exciting, visionary, concrete
`field-marketing`	Audience engagement	Accessible, compelling

Quality Gate Customization

Different voices demand different standards. A dev advocate voice requires high authenticity (≥7) and low vendor-speak (≤2), while enterprise marketing allows more vendor-speak (≤4) but demands high persona-fit (≥7).

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12. Data Model Overview

Database: SQLite + Drizzle ORM — 14 Tables

Group	Tables	Purpose
Configuration	`voiceProfiles`, `assetTemplates`, `systemConfig`	Voice definitions, templates, settings
Discovery	`discoveryJobs`, `discoveryResults`	Community source polling
Product	`products`, `productInsights`	Uploaded docs, extracted insights
Research	`communityResearch`, `competitiveResearch`	Deep Research results with citations
Generation	`generationJobs` (incl. `pipelineSteps`), `generatedAssets`, `assetVersions`	Pipeline execution, content, versions
Quality	`qualityScores`	Per-dimension scores with feedback
Traceability	`evidenceLinks`	Maps claims to source evidence

Entity Relationships

```
Products ← ProductInsights ← GenerationJobs → GeneratedAssets
                                                    │
                                    CommunityResearch    QualityScores
                                    CompetitiveResearch  AssetVersions
                                                         EvidenceLinks
```

Appendix A: API Endpoints

Hono REST API at `http://localhost:3007` - Product management (CRUD), Pipeline execution (trigger, status, cancel) - Asset management (list, view, compare versions), Workspace actions - Quality scores, Research results, Voice profiles, Admin auth (JWT)

Appendix B: Frontend Pages (Admin UI)

10 React pages: Dashboard, Products, Pipelines, Assets, Workspace, Quality, Research, Voice Profiles, Discovery, Settings.

Document generated February 2025 — Updated with pipeline refactor (4 pipelines, sequential DAG, shared refinement loop) PMM Messaging Engine — Technical Documentation v2.0