

Universal Consistency Engine: System Overview

The **Universal Consistency Engine** is a deterministic AI-powered platform designed to automate technical copyediting. It ensures that complex documents adhere to specific style guides regarding spelling, unit notation, and punctuation.

1. Core Capabilities

- **Dynamic Rule Extraction:** Uses Gemini to transform human-readable style guides into structured JSON logic.
 - **Deterministic Editing:** Applies rules with zero "creative drift," ensuring only violations are changed.
 - **Audit Transparency:** Provides a step-by-step playback of changes, including confidence scores and reasoning for every edit.
 - **Portability:** Supports "Style Packs" for instant importing and exporting of established rule sets.
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2. Workflow: How it Works

The system operates in a three-phase cycle to ensure high precision:

Phase A: The Knowledge Build (Architect Mode)

1. **Input:** User uploads a Style Guide (e.g., "Always use British spelling and no apostrophes in decades").
2. **Parsing:** The backend sends this to the AI with a "Style Architect" prompt.
3. **Output:** A JSON configuration is generated, defining **Triggers** (what to look for) and **Instructions** (how to fix it).

Phase B: The Processing Loop (Editor Mode)

1. **Input:** User pastes "messy" technical text into the dashboard.
2. **Matching:** The engine scans the text for patterns that match the JSON Triggers (e.g., it finds "1990's" or "modeled").
3. **Correction:** The AI generates a `corrected_text` block and a `changes` array containing the "Original" vs. "New" strings.

Phase C: The Visual Audit (User Review)

1. **Highlighting:** The UI uses the `changes` array to wrap corrected words in `` tags.
2. **Playback:** The user uses the Playback Slider to see each correction happen in sequence.

3. **Validation:** Users review the "Why" (explanation) and "Confidence" score for each pill-style audit log.

3. Technical Stack

Component	Technology	Role
Backend	Python (Flask)	Handles routing, file parsing, and API communication.
AI Engine	Gemini 1.5 Flash	Powers the Architect (rules) and the Editor (corrections).
Frontend	HTML5 / JS / CSS3	Manages the interactive playback, mini-map, and highlighting.
Data Format	JSON	The "bridge" that ensures the AI instructions are readable by the UI.

SNAPSHOTS:

Universal Consistency Engine

1. Knowledge Extraction

Upload your Style Guide (PDF/DOCX/TEXT) to generate JSON logic.

Choose File

input.txt

EXTRACT JSON RULES

DOWNLOAD JSON

EXPORT STYLE PACK

Import Style Pack (JSON)

Choose File

No file chosen

Style packs include rules - examples so teams can reuse your guide

```
{  "category": "Decades",  "instruction": "Omit the apostrophe when referring to decades (e.g., 1990s, 1980s, 2020s).",  "rule_id": "decade_apostrophe_001",  "triggers": [    "1990s",    "1980s",    "2020s"  ]},  {  "category": "Spelling",  "instruction": "Use British English spelling consistently (e.g., modelled).",  "rule_id": "spelling_001",  "triggers": [    "modelled"  ]},  {  "category": "Units",  "instruction": "Use the correct symbol and spacing for microliters (uL).",  "rule_id": "units_spacing_001",  "triggers": [    "uL"  ]},  {  "category": "Units",  "instruction": "Omit the space between the number and"
```

2. Deterministic Correction

TECHNICAL AUDIT: QUANTUM PROCESSOR THERMAL LOAD (REV. 2026)

The refrigeration manifold, which was originally prototyped in the late 1990's, demonstrated a significant thermal drift of ± 0.05 K during the sub-Kelvin cooling phase. We modeled the superconducting state transitions using the 2024 program logic, but the sequence was canceled when the micro-leak reached 15 uL per minute.

A secondary anomaly was detected in the color-coded fiber optics at a frequency of $\sim 4.5 \times 10^{-9}$ Hz. The lead physicist, the hardware specialist and the cryogenic technician must re-calibrate the modeling software before the 2020's end. Currently, the reliability margin is 98.5 %, which is a 3% improvement over the legacy 1980's benchmarks. If the modelled data is not verified, the color-coding will be reset.

APPLY & HIGHLIGHT

Corrected Output:

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Audit Trail:

punctuation_001: lead physicist, the hardware specialist and the cryogenic technician -> lead physicist, the hardware specialist, and the cryogenic technician

spelling_001: modelled - modelled

decade_apostrophe_001: 1990's - 1990s

decade_apostrophe_001: 2020's - 2020s

units_spacing_002: 98.5 % - 98.5%

decade_apostrophe_001: 1980's - 1980s

units_spacing_001: uL - uL

units_spacing_002: 3 % - 3%

Consistency Playback

Scrub the timeline to see each rule applied step by step.

Category: 1 - Misc ->
"Instruction": "omit the space between the number and μ"

Play

Step 10 of 10: Final output

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A secondary anomaly was detected in the color-coded fiber optics at a frequency of ~ 4.5 x 10^9 Hz. The lead physicist, the hardware specialist, and the cryogenic technician must re-calibrate the modelling software before the 2020s end. Currently, the reliability margin is 98.5%, which is a 3% improvement over the legacy 1980s benchmarks. If the modelled data is not verified, the color-coding will be reset.

Compare Models

☐ Foundry: gemini-2.0-flash ☒ OpenAI (Foundry): gpt-4o-mini ☒ Vertex AI (Anthropic): claude-3-haiku@20240307 ☒ Groq (Foundry): llama-3.3-70b-versatile

Add Foundry models (comma-separated), e.g. gemini-2.0-flash, gemini-1.5-flash

COMPARE MODELS

openai:gpt-4o-mini

Changes: 8

CORRECTED OUTPUT

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vertexai-anthropic:claude-3-haiku@20240307

Changes: 6

CORRECTED OUTPUT

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groq:llama-3.3-70b-versatile

Changes: 8

CORRECTED OUTPUT

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