Universal Terms De-mystifier: GenAI for Digital Informed Consent

A Browser Extension for Transparency in Terms of Service

Sleepless Coding Saga 3.0 Submission

The Problem: Designed for Obfuscation

People rarely read website/app privacy policies, Terms of Service (ToS), or cookie banners. These legal texts are routinely **long, unclear, and specifically designed to obfuscate meaning**. The result is a broken system of digital consent, where users inadvertently agree to risky terms, data sharing, or hidden fees. This leads to profound issues with privacy and consumer rights.

The Solution: A Single-Click Transparency Layer

The Universal Terms De-mystifier is a browser extension that overlays a simple, compact **“Summary Bar”** on any site containing legal text. With one click, it uses cutting-edge Generative AI to instantly transform dense legalese into clear, actionable insights.

- **Smart Extraction:** AI finds and explains *only* the critical points, not just a surface-level summary.
- **Actionable Flags:** Immediately highlight concerns like: “Did you know: This site records microphone input” or “Auto-renews unless cancelled.”
- **Risk Color-Coding:** Visual cues rapidly communicate the severity of each clause.

Working Mechanism & Key Features

The extension follows a lean process to deliver instant, contextual transparency:

1. **Detection:** Identifies legal text automatically on any webpage using DOM parsing and heuristics.
2. **Processing:** Extracted text is sent to the dedicated AI Backend for analysis (See Section 3).
3. **Overlay Bar:** Displays a compact, minimal-UI summary bar that expands into simplified sections when clicked.
4. **Categorization:** Groups clauses under thematic headers: *Privacy, Subscription, Cancellation, User Rights,* and *Fees.*
5. **Presentation:** Presents the extracted clauses with their associated risk score.

Risk Assessment System

The core value lies in the **Color Coding** system and **Industry Benchmarks**:

Flag	**Indicator**	**Implication**
Safe	✓	The clause is standard, favorable, or neutral to the user.
Caution	?	The clause requires attention (e.g., auto-renewal, liability limit).
Risky	×	The clause is highly unfavorable (e.g., data sold to third parties, expansive rights grant).

Extension Features Summary

- **Browser Compatibility:** Works across major browsers (Chrome, Firefox, Edge).
- **Benchmarking:** Compare specific terms against typical industry standards (e.g., ”better/worse than typical SaaS”).
- **Data Handling:** Local caching allows offline summary access and rapid analysis on return visits.
- **Export & Share:** Allows users to save risky clauses or share anonymized “gotchas” as a social feed to promote collective awareness.
- **UI/UX:** Minimal, user-friendly interface with a clear comparison dashboard for quick risk insight.

Technology Stack & AI Deep Dive

Our architecture is split into a lightweight client and a powerful, secure AI backend, leveraging serverless computing.

Core Technologies

- **Frontend:** HTML, CSS, JavaScript, **React.js/Tailwind** for a sleek, responsive UI. Browser Frameworks: Chrome Extension API (Manifest V3) and Mozilla WebExtensions API.
- **Backend (General):** Node.js with Express.js for general API routing. MongoDB/Firebase for storing user preferences and global risk benchmarks.
- **Processing (Local):** DOM parsing and Regex for initial clause extraction.

The Generative AI Component (The Core Intelligence)

The core functionality of extraction, explanation, and risk assessment is **impossible without powerful Generative AI**.

1. Structure: The AI operates as a separate backend service, built using **Python** and hosted on a serverless platform (**Google Cloud Run**).

- **Client-Side (JS/TS):** Extracts raw legal text → Sends via HTTP request.
- **Server-Side (Python/FastAPI):** Receives text → Interacts securely with **Gemini API** (**gemini − 2.5 − flash**
→ Formats structured JSON → Sends result back.

2. Why Gemini-2.5-Flash & Why a Backend?

- **Smart Extraction:** LLMs excel at understanding the variability of legal language across sites to extract specific, critical clauses, outperforming traditional rule-based systems.
- **Security:** Gemini’s computational power requires resources a browser cannot provide. Furthermore, using a backend securely protects the sensitive API keys, preventing unauthorized exposure or use, which is critical for extension development.

- **Scalability:** Cloud Run automatically scales the Python FastAPI service to handle thousands of concurrent requests if the extension gains popularity.

3. Implementation Detail: Prompt Engineering The most critical task is crafting precise instructions for the LLM to ensure accuracy and machine-readability. We mandate **Structured JSON Output** via prompt engineering to consistently receive: 1) the overall summary, 2) the risk assessment (HIGH/MEDIUM/LOW), 3) the simplified explanation, and 4) the *exact original text snippet* for highlighting.

Scalability and Future Vision

The modular architecture ensures rapid deployment and high future growth potential:

- **Multi-Language Support:** The Gemini API's native multi-language capabilities allow for extension to multiple global languages with minimal prompt adjustment.
- **Cross-Platform:** Built using Chrome and Mozilla WebExtensions API, ensuring immediate compatibility across Chrome, Firefox, Edge, and Safari (via Safari Extension Converter).
- **Enterprise Adaptation:** The backend design can be repurposed for *enterprise compliance monitoring*, allowing companies to automatically audit their own legal text against competitors or regulatory standards.
- **Community Repository:** Future development includes a community-driven repository where users can anonymously submit feedback on flagged clauses, providing real-world data to continuously refine and improve the AI's risk assessment models.

Visual Concepts

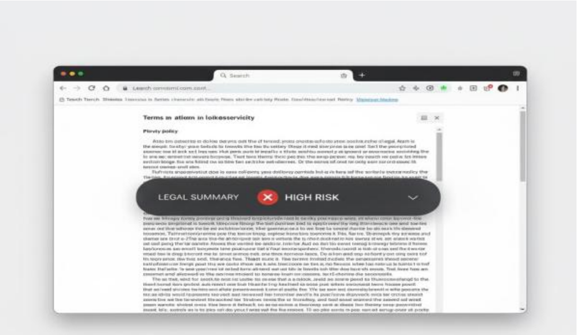

Figure 1: Concept: Minimalist overlay bar with risk indicator.

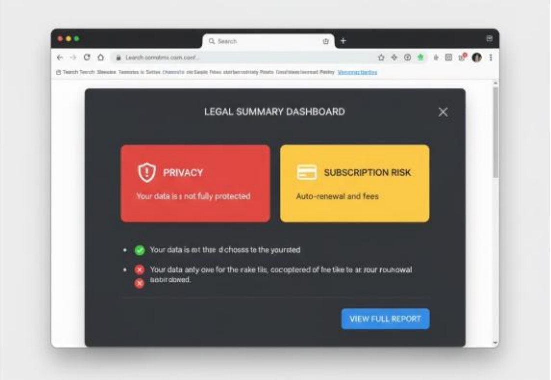

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Figure 2: Concept: Expanded view with colour- coded risk assessment dashboard.