**Module 7: Smart SEO Optimizer**

## 🔍 What This Module Does:

An intelligent, automated SEO refinement system that audits and enhances meta titles, descriptions, and discoverability of blog posts, products, and category pages. It uses real-time search trend data, CTR signals, and AI-generated rewrite logic to optimize for click-through rates and better rankings.

## ✨ Core Features

### 1. 🌐 Google Trends + Local Query Matching

* Integrates Google Trends hourly via pytrends with localized (BD/SAARC) filters.
* Maps trending keywords to product vectors or blog topics.
* Example: “niacinamide serum price BD” ➔ match to best-selling niacinamide product page.

**How to Build:** - API: GET /trend-matches - Process: - Fetch rising queries for category terms (e.g., “serum”, “pigmentation”, “glow skin”). - Use FAISS to vector-match to relevant product/blogs. - Score by trend match + click-through rate + availability.

### 2. 📈 Meta Title + Description Refresher

* Audits every product/blog/category SEO metadata weekly.
* Flags underperforming CTR (via GA4 API)
* Uses OpenAI to generate improved variants.

**Codex Prompt Format:** > Rewrite this product’s meta title and description to improve SEO. Focus on benefits, include brand and target keyword “[TERM]”. Target audience is women in Bangladesh looking for [CONCERN].

**How to Build:** - Cron job: weekly scan - Query CTR + bounce data from GA4 - GPT batch generator + store diff - Manual override or auto-publish based on brand settings

### 3. ⚡ Auto-Refresh Engine

* Low-performance pages get refreshed in background mode.
* Uses content embeddings to ensure context relevance isn’t lost.
* Supports multi-lingual outputs (BN, HI, UR, EN).

**API:** - POST /refresh-metadata - Input: page\_id, reason, lang, current\_metadata - Output: { improved\_title, improved\_meta, confidence\_score }

### 4. 🌎 SEO Score Analyzer

* Gives per-page health score: CTR trend, bounce, keyword overlap, freshness, duplicate detection
* Provides smart suggestions per field

**Frontend UI:** - Page table with: - ✔ SEO Score - ↓ CTR drop - 📅 Last updated - ✔ “Improve” button (triggers GPT patch)

### 5. ✨ Multilingual Meta Support

* Automatically generates alternate language meta info for blogs + products
* Output fields: meta\_bn, meta\_hi, meta\_ur

### 6. 🎡 Brand Tone Calibration

* Each brand can define tone: Informative / Expert / Casual / Aspirational
* Affects GPT rewrite style

## 📅 Technical Stack

* Scheduler: Redis Queue + Cron Jobs
* NLP: OpenAI Codex, FAISS
* CTR/Analytics: GA4 API
* Frontend: React + Table Grid + Diff Preview UI

## 📌 Usage Settings

**Brand-Level Control Panel** - Enable/disable auto SEO - Set review before publish (Manual, Auto, Assisted) - Upload brand tone samples - Select active languages

**Superadmin Controls** - GPT usage quota - Max pages to optimize/month - Logs of regenerated metadata

## 🔄 Integrations

* Blog Engine: Pass stale blogs for metadata update
* Auto Poster: Use refreshed titles in post captions
* Smart Widget: Improve product discovery terms

## ✅ Useful Outcomes

* Higher click-through rate on search
* Better local keyword targeting
* SEO-friendly content refresh without manual editing

This module, once active, runs 90% automatically and generates massive SEO value with minimal brand input. Suitable for both aggressive and passive brands alike.

Next Module to Document: **Shared OAuth + App Infrastructure**