

GEO/AI Search Monitoring platform

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Business Layer Overview

The platform serves **three main user personas**:

1. **Marketing & Growth Teams** → want visibility and brand share in AI search.
2. **SEO & Content Teams** → need actionable fixes to improve citation rates.
3. **Executives & Analysts** → want measurable KPIs, ROI, and competitive advantage.

We'll break each layer into **how users perform tasks**, **business benefits**, and **technical architecture**.

Layer 1: Discover & Plan

Business Goal: Define "what questions to track" and "which engines to monitor."

1. Prompt & Topic Manager

How Users Use It:

- Create "topics" that represent business verticals (e.g., *Herbal Ingredients*, *Protein Powders*).
- Add "prompts" — the natural questions customers ask in AI search ("Who are the best suppliers of ashwagandha extract?").
- Assign regions and engines (ChatGPT, Perplexity, Gemini, Copilot).
- Set daily/weekly cadence, budgets, and competitor brands.

Business Benefit:

- Understand **what conversations matter** for the brand.
- Manage spending on prompt monitoring.
- Establish measurable search coverage (topics vs visibility).

Technical Implementation:

- **Data Model:** `topics`, `prompts`, `plans`.
 - **AWS Services:** EventBridge (scheduler), Step Functions (plan orchestrator).
 - **API:** REST endpoints `/plans`, `/prompts`, `/topics`.
 - **Storage:** DynamoDB (plans), S3 (prompt lists).
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Layer 2: Monitor & Understand

Business Goal: Measure brand visibility, identify competitors' citations, and detect market shifts.

2. Engine Connectors

How Users Use It:

- Automatically queries ChatGPT, Gemini, and Perplexity daily.
- Users can manually trigger a "re-run" to test after making content updates.
- View snapshots (answers + citations + screenshots) per prompt.

Business Benefit:

- Transparent proof of how AI engines perceive and cite your brand.
- Early detection when your brand **drops out** of model answers.

Technical Implementation:

- **Collectors:** Fargate + Playwright simulate user prompts.
 - **Data Capture:** HTML, JSON, screenshots to S3 (`/raw/{engine}/{date}`).
 - **Monitoring:** CloudWatch for success rate & engine response times.
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3. Parser & Normalizer

How Users Use It:

- End users don't interact directly; backend unifies outputs from all engines.
- Data appears normalized in the "Prompt Explorer" UI with unified schema.

Business Benefit:

- Consistent comparison across AI engines (ChatGPT vs Gemini).
- Faster insights without worrying about technical differences.

Technical Implementation:

- **Lambda pipeline** triggered by S3 upload.
 - Extracts: answer text, citations, brands.
 - **Storage:** DynamoDB `answers` + `citations`.
 - **Index:** OpenSearch for prompt-based queries.
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4. Brand & Competitor Resolver

How Users Use It:

- Define brand aliases (URLs, product names, abbreviations).
- System automatically maps mentions and URLs in answers to brand identities.

Business Benefit:

- Quantifies competitive share: "Perplexity cites us in 30% of relevant prompts."
- Monitors new entrants and citation leaks.

Technical Implementation:

- **Brand Map DB:** `brands`, `aliases`.
 - **Entity Matching:** Fuzzy search + domain parsing.
 - **Graph:** Optional Neo4j for relationships `Brand → Domain → Topic`.
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5. Scoring & Trends

How Users Use It:

- Dashboard shows *Answer Share*, *Citation Share*, *Prominence Index*, *Sentiment*.
- Compare current vs last week/month.
- Export reports for leadership meetings.

Business Benefit:

- Quantifies performance in AI search (GEO equivalent to SEO analytics).
- Detects spikes or declines per engine/locale.

Technical Implementation:

- **Batch Jobs:** Step Functions trigger Lambda aggregator nightly.
 - **Store:** `scores` in DynamoDB; analytics indexed in OpenSearch.
 - **Charts:** React + ECharts on the front-end.
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Layer 3: Optimize & Execute

Business Goal: Turn insights into actions that improve visibility.

6. GEO Audit Crawler

How Users Use It:

- Run audits of your own website.
- View missing FAQ blocks, schema tags, canonical issues.
- Link each issue to affected prompts and expected visibility gains.

Business Benefit:

- Fixes concrete, technical and content issues that block citation.
- Aligns SEO and content teams to measurable GEO performance.

Technical Implementation:

- **Crawler Engine:** Playwright (renders JS), respects robots.txt.
- **Checks:** schema.org validation, meta tags, H1s, FAQ presence.

- **Results:** audits table → fix recommendations.
 - **Integration:** Jira API for task creation.
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7. Insights & Action Center

How Users Use It:

- Receive ranked list of actions (e.g., "Add FAQ schema to Product X").
- See expected impact and evidence of why (competitor example, lost prompt).
- Use built-in LLM to draft optimized content outline.

Business Benefit:

- Converts analytics into specific, measurable actions.
- Saves content teams hours of manual analysis.

Technical Implementation:

- **Recommendation Engine:** Heuristic + regression (lost prompts × competitor share).
 - **LLM Assist:** OpenAI Responses API generates outlines/snippets.
 - **Integration:** Connects to CMS or project management tool (e.g., Notion, Jira).
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8. LLM Emulator (Test Harness)

How Users Use It:

- Test two page variants before publishing.
- Simulate how ChatGPT or Perplexity would respond.
- Compare which version is more "cite-worthy."

Business Benefit:

- Predicts impact before committing to major content revisions.
- De-risks SEO/GEO changes.

Technical Implementation:

- **LLM Sandbox:** Uses temperature=0, deterministic prompts.

- **Judge Model:** Evaluates content relevance and authoritativeness.
 - **Storage:** `emulation_runs` with rationale & winner variant.
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9. Experiment Lab

How Users Use It:

- Run real-world A/B experiments for changed pages or new content.
- Monitor AI search results for lift post-change.

Business Benefit:

- Measures ROI of content optimization in real traffic-like scenarios.
- Builds internal benchmarks and best practices.

Technical Implementation:

- **Design:** Pre/post analysis pipeline.
 - **Stats Engine:** Bayesian uplift modeling.
 - **Dashboard:** Experiment outcome report with significance levels.
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📣 Layer 4: Communicate & Automate

Business Goal: Keep stakeholders updated and aligned automatically.

10. Alerts & Digests

How Users Use It:

- Subscribe to Slack/email alerts: "We lost 10% share in Gemini."
- Weekly digest shows gains, losses, new competitors.

Business Benefit:

- Keeps marketing, executives, and SEO aligned without manual checks.
- Fast reaction to visibility drops.

Technical Implementation:

- **EventBridge Rules:** detect metric anomalies.

- **Delivery:** SES + Slack Webhook; weekly batch generator.
 - **Templates:** Markdown-based digest messages.
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11. Dashboard & Analyst Workbench

How Users Use It:

- Create saved views for "US Market, ChatGPT" or "Top 10 Competitors."
- Annotate trend lines with events ("Added schema fix on Feb 10").
- Export PDFs for reporting.

Business Benefit:

- Easy executive storytelling with visual proof (screenshots, graphs).
- Eliminates reliance on SEO spreadsheets.

Technical Implementation:

- **Frontend:** Next.js + React + Tailwind + Recharts.
 - **Backend:** OpenSearch queries.
 - **Exports:** Puppeteer PDF generator for executive reports.
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12. API & Integrations

How Users Use It:

- Integrate GEO data into internal BI dashboards or CRM.
- Pull real-time Answer/Citation data for internal content dashboards.

Business Benefit:

- Seamless data sync for decision-making and KPI tracking.
- Adds GEO as a native metric in company analytics.

Technical Implementation:

- **API Gateway:** `/scores` , `/citations` , `/audits` .
- **Auth:** Cognito JWT.

- **Webhooks:** push new “loss” events to Slack or internal dashboards.
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Layer 5: Admin & Governance

Business Goal: Enable scale, reliability, and compliance.

13. Tenancy & Billing

How Users Use It:

- Workspace admins manage team members, set permissions, and monitor usage.
- Billing dashboard tracks run volume and seat usage.

Business Benefit:

- Transparency on usage/costs; predictable subscription model.

Technical Implementation:

- **Auth:** Cognito user pools, group roles.
 - **Billing:** Stripe metered billing integration.
 - **Usage Logs:** DynamoDB counters for run and prompt volume.
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14. Compliance & Observability

How Users Use It:

- Legal/security teams view data retention settings and run audits.
- Engineers track SLA uptime, error rates, and engine performance.

Business Benefit:

- Trust & compliance for enterprise customers.
- High availability and audit readiness.

Technical Implementation:

- **Observability:** CloudWatch dashboards + X-Ray traces.
- **Compliance:** S3 lifecycle policies, KMS encryption, access logs.

- **SLA Enforcement:** daily pipeline freshness checks (e.g., "All engines synced by 9:00 AM").
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🏁 Business Impact Summary

Feature	Business Benefit	Revenue/ROI Impact
Prompt & Topic Manager	Aligns GEO strategy with brand topics	Saves analyst hours; better coverage
Engine Monitoring	Proof of brand presence or absence	Defends market visibility
GEO Audit	Converts tech issues to measurable lift	Improves citation share (SEO 2.0)
Action Center	Prioritized roadmap for content team	Faster wins, higher ROI
LLM Emulator	Predicts content impact before launch	Reduces failed updates
Alerts & Digests	Continuous awareness	Immediate response, less visibility loss
Dashboard	Executive visibility with proof	Supports marketing/board reports
Experiments	Quantifies what works	Enables data-driven optimization

🚀 Final Business Narrative

For marketers: You finally see how AI search engines describe your brand and your competitors.

For content teams: You get a prioritized to-do list to become more "AI-citable."

For executives: You get dashboards showing ROI from every optimization.

For the organization: You gain control over how generative AI talks about you — and proof that your GEO strategy works.