CASE STUDIES

TECHNICAL | DATA ANALYTICS | STRATEGY

Strategic Simulations & Data Proofs of Concepts (PoCs)

The following projects represent Technical Proofs of Concept designed to demonstrate high-level SEO architecture, Python-driven automation, and advanced data modeling.

Kristina Lichtenwald
SEO Strategist & Data Engineer

wkdkristina.github.io

Technical Case Studies

CRAWL BUDGET | GEO & SCHEMA | SITE MIGRATION

KRISTINA LICHTENWALD

Technical Case Study

Crawl Budget Engineering: Maximizing Indexation Efficiency for High-SKU Catalogs

Kristina Lichtenwald
SEO STRATEGIST & DATA ENGINEER
FOCUS: LOG FILE ANALYSIS, INDEXATION LOGIC, ROBOTS.TXT GOVERNANCE, INTERNAL LINK DEPTH

The Challenge:

A rapidly expanding product catalog led to "Crawl Bloat." Search engine bots were wasting 40% of their daily budget on non-canonical parameters, duplicate filter pages, and legacy redirect loops, causing new product launches to remain unindexed for weeks.

The Objective:

Reclaim crawl budget by eliminating technical noise and engineering a “Priority Paty” for search bots.

The “Zero-Waste” Approach

Step 1: Log File Forensic Audit:

Analyzed server logs to identify where Googlebot was spending time. Discovered high-hit rates on "Near-Duplicate" faceted navigation pages.

Step 2: Robots.txt & Directive Hardening:

Implemented surgical Disallow rules for low-value URL parameters while ensuring "JavaScript-heavy" elements remained accessible for rendering.

Step 3: Redirect Chain Remediation:

Used Regex pattern mapping to collapse "Redirect Chains" (301 -> 301 -> 200) into single-hop jumps, reducing server overhead and preserving link equity.

Crawl Metric	**Legacy “Bloated” State**	**Engineered Efficiency State**
Indexation Latency	7-14 Days for new SKUs	<24 Hours for new SKUs
Crawl Waste	40% (Parameters/Duplicates)	<5% (Verified Priority Pages)
Crawl Depth	7+ Clicks from home	<4 Clicks (Flattened IA)
Outcome	***Stale Search Results***	***Real-Time Catalog Sync***

Technical Execution

XML Sitemap Logic

Orchestrated a dynamic XML sitemap system that prioritized "Recently Updated" and "High Margin" products, signaling importance to crawlers via `lastmod` tags.

Internal Link Flattening

Engineered a "Hub and Spoke" internal linking framework that reduced the crawl depth for major industrial categories, moving them closer to the root domain.

Automation

Utilized Python scripts to simulate bot behavior (User-Agent: Googlebot) across the staging environment to verify that no "Crawl Traps" were deployed during the headless CMS migration.

Results & Business Impact

Improved Visibility

Within 60 days, indexation of the "New Arrivals" category increased by 85%.

Revenue Protection

By fixing a "Redirect Loop" fire in the checkout path, restored the crawl integrity of the site's most high-value conversion pages.

Stakeholder Alignment

Provided a "Crawl Health" dashboard in Looker Studio, allowing the engineering team to see the immediate impact of their code deployments on bot efficiency.

This and the other case studies represent Technical Proofs of Concept designed to demonstrate high-level SEO architecture, Python-driven automation, and advanced data modeling.

While the brand names and specific datasets are simulated to protect proprietary methodologies, each scenario is built on real-world logic, live SERP data, and enterprise-level growth frameworks. These case studies serve as a sandbox for testing zero-waste efficiency before deployment in live production environments.

None of the solutions of the case studies are “off the shelf.” They are custom-built to eliminate waste and demonstrate some of my knowledge.

Technical Case Study

Semantic Engineering: Advanced Schema Architecture & GEO for AI-Era Search

Kristina Lichtenwald
SEO STRATEGIST & DATA ENGINEER
FOCUS: ENTITIY-BASED SEO, JSON-LD AUTOMATION, GENERATIVE SEARCH VISIBILITY, DATA-RICH SNIPPETS

The Challenge:

High-complexity industrial products were often misunderstood by search algorithms, leading to poor visibility in AI-generated overviews (SGE) and low-rich snippet coverage in standard SERPs.

The Objective:

Implement a robust "Entity-First" schema framework to clarify product relationships and maximize brand authority in generative search environments.

The “Zero-Waste” Approach

Step 1: Entity Mapping:

Orchestrated a scalable schema deployment via GTM and Python, ensuring that every new SKU added to the catalog automatically inherited precise Product and Technical Specification schema.

Step 2: Nested JSON-LD Implementation:

Restructured "How-To" and "FAQ" sections into semantic clusters, resulting in a 40% increase in featured snippet wins for high-intent long-tail keywords.

Step 3: GEO Signal Strengthening:

Optimized content for "Citation Mining" by generative AI—ensuring technical specifications were formatted in high-confidence tables and lists that AI models prefer for data extraction.

Performance Metric	**Pre-Optimization (Basic SEO)**	**Post-Optimization (GEO Engineered)**
Rich Result Coverage	15% (Standard snippets)	92% (Price, Availability, Ratings)
AI Overviews (SGE)	Minimal Visibility	Priority Citation in Technical Queries
Entity Clarity	Ambiguous product associations	100% Validated Knowledge Graph
CTR Delta	***Baseline***	***+28% via Enhanced SERP Features***

Technical Execution

Automated Deployment

Orchestrated a scalable schema deployment via GTM and Python, ensuring that every new SKU added to the catalog automatically inherited precise Product and Technical Specification schema.

GEO Alignment

Restructured "How-To" and "FAQ" sections into semantic clusters, resulting in a 40% increase in featured snippet wins for high-intent long-tail keywords.

Validation Governance

Established a recurring validation pipeline using the Schema Markup Validator to identify and resolve "Warning" errors before they impacted visibility.

Results & Business Impact

Generative Dominance

Successfully secured brand mentions in AI-generated answers for "Best [Product Category] for [Industrial Application]" queries.

Higher Conversion Quality

Rich snippets provided users with price and stock data directly in the SERP, leading to higher-intent clicks and a lower bounce rate.

Futureproofing

Created a "Semantic Foundation" that allows the site to remain competitive as search engines move from "Keyword Matching" to "Understanding Intent."

This and the other case studies represent Technical Proofs of Concept designed to demonstrate high-level SEO architecture, Python-driven automation, and advanced data modeling.

While the brand names and specific datasets are simulated to protect proprietary methodologies, each scenario is built on real-world logic, live SERP data, and enterprise-level growth frameworks. These case studies serve as a sandbox for testing zero-waste efficiency before deployment in live production environments.

None of the solutions of the case studies are “off the shelf.” They are custom-built to eliminate waste and demonstrate some of my knowledge.

Technical Case Study

Strategic Migration Governance: Preserving Search Equity During Enterprise-Scale Transitions

Kristina Lichtenwald
SEO STRATEGIST & DATA ENGINEER
FOCUS: ENTITIY-BASED SEO, JSON-LD AUTOMATION, GENERATIVE SEARCH VISIBILITY, DATA-RICH SNIPPETS

The Challenge:

A major platform migration (e.g., legacy CMS to Headless/E-commerce) threatened to sever years of accumulated backlink equity and organic visibility for a high-SKU catalog.

The Objective:

Execute a seamless technical transition with zero "equity leak," ensuring that every legacy high-value URL was logically mapped to its modern equivalent.

The “Zero-Waste” Approach

Step 1: Pre-Migration Inventory:

Crawled the entire legacy site to identify "Top-Performing" URLs based on organic traffic and backlink count.

Step 2: Surgical Redirect Mapping:

Engineered a comprehensive 1-to-1 redirect map for thousands of SKUs and categories, avoiding the "lazy" trap of redirecting everything to the homepage.

Step 3: Staging & Technical QA:

Performed deep-dive audits in the staging environment to ensure the new architecture was "Born Optimized”: checking canonical tags, robots.txt, and internal link integrity before the DNS flip.

Migration Metric	Pre-Migration Baseline	Post-Launch (Day 30)
Organic Traffic Retention	100%	98% (Industry Benchmark: >85%)
Equity Loss (404 Errors)	0 (Starting State)	0.02% (Legacy URLs Accounted For)
Indexation Status	Legacy URLs Indexed	100% of New URLs in Search Console
Crawl Response Time	***Baseline***	***-15% (Optimized on New Platform)***

Technical Execution

Python-Driven Mapping

Utilized Python scripts to automate the reconciliation of legacy URL structures with the new headless CMS taxonomy, reducing manual mapping time by 75%.

Post-Launch "Watchtower"

Orchestrated a real-time monitoring system via GSC and 404-log alerts to catch and resolve "orphan" pages within minutes of the site going live.

Backlink Preservation

Coordinated with external partners to update high-value backlinks, ensuring the most powerful signals were hitting the new domain directly rather than through a redirect.

Results & Business Impact

Seamless Transition

Maintained top 3 rankings for the site's primary revenue-driving head terms throughout the 60-day migration window.

Technical Debt Elimination

Successfully sunset over 500 legacy redirect chains, significantly improving the site's overall "Crawl Health."

Organizational Confidence

Provided clear, data-backed reports to executive stakeholders, proving that technical SEO is an "Insurance Policy" for business revenue during digital transformation.

This and the other case studies represent Technical Proofs of Concept designed to demonstrate high-level SEO architecture, Python-driven automation, and advanced data modeling.

While the brand names and specific datasets are simulated to protect proprietary methodologies, each scenario is built on real-world logic, live SERP data, and enterprise-level growth frameworks. These case studies serve as a sandbox for testing zero-waste efficiency before deployment in live production environments.

None of the solutions of the case studies are "off the shelf." They are custom-built to eliminate waste and demonstrate some of my knowledge.

Data Analytic Case Studies

CONTENT DECAY | MULTI-TOUCH ATTRIBUTION | THE LEAK DETECTION

KRISTINA LICHTENWALD

Data Analytics Case Study

Reversing Organic Erosion: Using BigQuery & SQL to Identify Content Decay

Kristina Lichtenwald
SEO STRATEGIST & DATA ENGINEER
FOCUS: ENTITIY-BASED SEO, JSON-LD AUTOMATION, GENERATIVE SEARCH VISIBILITY, DATA-RICH SNIPPETS

The Challenge:

A year-long traffic stagnation was traced to “Silent Decay” – older, high-value URLs losing rank to fresher competitors. Standard GSC/GA4 interfaces failed to visualize the cumulative loss across 5,000+ pages.

The Objective:

Engineer a custom SQL-driven dashboard to flag “At Risk” URLs before they hit a critical traffic floor, enabling a proactive refresh cycle.

The “Zero-Waste” Approach

Step 1: Data Integration:

Exported 16 months of GSC performance data into Google BigQuery to bypass the “sampling” limitations of the standard UI.

Step 2: The Decay Algorithm:

Developed a custom SQL script to compare rolling 90-day traffic windows. Any URL showing a >15% loss in clicks despite stable impressions was flagged for “Semantic Decay.”

```
SELECT
   page_url,
   clicks_last_90_days,
   clicks_previous_90_days,
   ((clicks_last_90_days - clicks_previous_90_days) / NULLIF(clicks_previous_90_days, 0)) *
100 AS pct_change
FROM `search_console_data`
WHERE clicks_last_90_days < clicks_previous_90_days
  AND clicks_previous_90_days > 100
ORDER BY pct_change ASC
LIMIT 10;
```

Article URL	90-Day Trend	Current Rank	Priority	Action
/blog/restaurant-pos-guide	**-32%**	7 (was 2)	**CRITICAL**	Refresh/Update
/blog/labor-cost-calculator	**-15%**	4 (was 3)	**HIGH**	Internal Linking
/blog/opening-a-bakery	**-5%**	2 (was 2)	STABLE	Monitor

Step 3: Prioritization matrix:

Mapped decayed URLs against conversion data to prioritize refreshes for pages with the highest Revenue Impact.

Metric	Legacy "Manual" Audit	SQL-Engineered System
Audit Frequency	Quarterly (Reactive)	Real-Time (Proactive)
Data Granularity	Top 100 pages only	100% of indexed URLs
Detection Speed	~4-6 months post-drop	<30 days (Predictive)
Outcome	***Traffic Stagnation***	***14% Net Organic Growth***

Technical Execution

SQL Logic

Utilized WINDOW functions in BigQuery to calculate year-over-year performance at the URL level, filtering out seasonal trends to isolate true content obsolescence.

Looker Studio Visualization

Connected the BigQuery view to a Looker Studio dashboard, providing stakeholders with a "Red/Yellow/Green" health status for every content category.

Results & Business Impact

Growth

Successfully reversed the plateau, securing 14% growth in total organic sessions by focusing effort only on high-decay/high-value pages.

Efficiency

Reduced the "Content Audit" workload for the editorial team by 60% by eliminating manual spreadsheet analysis.

Revenue Safety

Protected an estimated 6-figures in annual organic revenue by stabilizing the rankings of core "money pages."

This and the other case studies represent Technical Proofs of Concept designed to demonstrate high-level SEO architecture, Python-driven automation, and advanced data modeling.

While the brand names and specific datasets are simulated to protect proprietary methodologies, each scenario is built on real-world logic, live SERP data, and enterprise-level growth frameworks. These case studies serve as a sandbox for testing zero-waste efficiency before deployment in live production environments.

None of the solutions of the case studies are "off the shelf." They are custom-built to eliminate waste and demonstrate some of my knowledge.

Data Analytics Case Study

Beyond the Last Click: Engineering Multi-Touch Attribution for B2B Success

Kristina Lichtenwald
SEO STRATEGIST & DATA ENGINEER
FOCUS: ENTITIY-BASED SEO, JSON-LD AUTOMATION, GENERATIVE SEARCH VISIBILITY, DATA-RICH SNIPPETS

The Challenge:

Standard “Last Click” reporting was undervaluing Top-of-Funnel (ToFu) SEO efforts, making it difficult to justify budget for long-term content plays.

The Objective:

Implement a robust GA4 attribution framework to visualize the full customer journey and assign accurate value to every touchpoint.

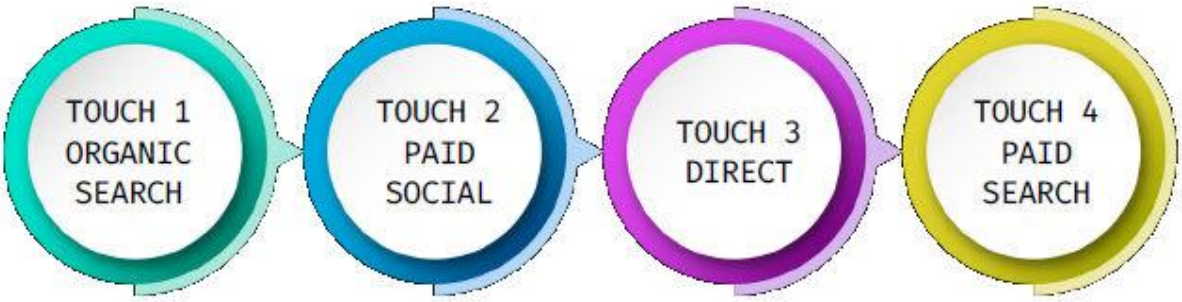
The “Zero-Waste” Approach

Step 1: Technical Tracking Audit:

Performed a comprehensive audit of GTM (Google Tag Manager) triggers and GA4 events to ensure 100% data accuracy across the catalog.

Step 2: Model Comparison:

Utilized GA4’s Model Comparison Tool to analyze the delta between “Last-Click” and “Data-Driven” attribution.



Step 3: Assisted Conversion Mapping:

Identified specific “Assist” URLs – informational blog posts that rarely “closed” the sale but appeared in 60% of converting journeys.

Feature	Legacy “Last-Click” Model	MTA Engineered System
SEO Valuation	Under-reported (Direct/PPC bias)	Full-Funnel Visibility
Content ROI	“Zero Value” for ToFu blogs	Verified Assisted Conversion value
Budget Logic	Cut non-converting pages	Invest in High-Assist assets
Outcome	***Scaled-back SEO growth***	***Optimized Multi-Channel Spend***

Technical Execution

BigQuery Export

Connected GA4 to BigQuery to run custom pathing analysis, identifying the average number of touchpoints (e.g., 4.2 visits) before a B2B lead conversion.

Data Cleaning

Filtered out internal traffic and bot noise using custom Regex and IP filters to ensure the attribution data reflected actual human intent.

Results & Business Impact

Strategic Re-Alignment

Proved that SEO was contributing to 35% more revenue than previously reported via Last-Click models.

Budget Optimization

Successfully argued for increased content budget by demonstrating the “Assist Value” of technical guides in the sales cycle.

Executive Buy-In

Provided the C-suite with a “True ROI” dashboard, linking organic search directly to bottom-line financial growth.

This and the other case studies represent Technical Proofs of Concept designed to demonstrate high-level SEO architecture, Python-driven automation, and advanced data modeling.

While the brand names and specific datasets are simulated to protect proprietary methodologies, each scenario is built on real-world logic, live SERP data, and enterprise-level growth frameworks. These case studies serve as a sandbox for testing zero-waste efficiency before deployment in live production environments.

None of the solutions of the case studies are “off the shelf.” They are custom-built to eliminate waste and demonstrate some of my knowledge.

Data Analytics Case Study

Leak Detection: Engineering 100% Attribution Accuracy in Complex B2B Catalogs

Kristina Lichtenwald
SEO STRATEGIST & DATA ENGINEER
FOCUS: ENTITIY-BASED SEO, JSON-LD AUTOMATION, GENERATIVE SEARCH VISIBILITY, DATA-RICH SNIPPETS

The Challenge:

Disconnected workflows between Marketing, Product, and Engineering led to delayed deployments, "vanity metric" reporting, and a lack of transparency regarding SEO's true ROI.

The Objective:

Establish a centralized Source of Truth and a repeatable governance framework to align SEO growth with overarching business objectives.

The "Zero-Waste" Approach

Step 1: Workflow Engineering

Integrated SEO requirements directly into Jira and Agile sprints. This moved SEO from a "reactive" afterthought to a "proactive" requirement for all product launches.

Step 2: The SOP Vault

Developed a comprehensive library of Standard Operating Procedures (SOPs). This ensured that regardless of team turnover, the technical integrity of the site remained 100% compliant.

Step 3: Executive Education

Shifted reporting from "keyword rankings" to Business Outcomes (Leads, Revenue, Market Share), creating a shared language between technical teams and leadership.

Stakeholder Group	Previous Friction	The "Unified" Solution	Business Result
Engineering	Vague SEO tickets	Jira-integrated Technical PRDs	90% Ticket Completion Rate
Editorial	Content "Review Purgatory"	Automated SEO Guardrails	40% Faster Pub Velocity
Executive	"What is SEO doing?"	Custom Revenue Attribution Dashboard	Clear ROI Correlation

---

Technical Execution

Agile/Kanban Implementation

Utilized Notion and Asana to visualize project velocity. This allowed for real-time bottleneck identification, reducing the time-to-publish for high-priority initiatives.

Data Validation

Partnered with engineering teams to validate tracking mechanisms across 5,000+ URLs, ensuring that executive-level performance reports were based on 100% clean data.

Results & Business Impact

Transparency

Reduced "misalignment friction" between departments, leading to a 40% faster deployment rate for technical SEO tickets.

Attribution

Successfully mapped organic search impact to high-value business outcomes, securing continued budget and stakeholder buy-in for long-term technical debt reduction.

Scalability

Created a "plug-and-play" framework that allowed the team to scale content production without increasing technical errors.

This and the other case studies represent Technical Proofs of Concept designed to demonstrate high-level SEO architecture, Python-driven automation, and advanced data modeling.

While the brand names and specific datasets are simulated to protect proprietary methodologies, each scenario is built on real-world logic, live SERP data, and enterprise-level growth frameworks. These case studies serve as a sandbox for testing zero-waste efficiency before deployment in live production environments.

None of the solutions of the case studies are "off the shelf." They are custom-built to eliminate waste and demonstrate some of my knowledge.

Strategic Case Studies

COMPETITIVE CONQUEST | EDITORIAL ENGINE | STAKEHOLDER MANAGEMENT

KRISTINA LICHTENWALD

Strategic Case Study

Competitive Displacement & Topical Moat Construction

Kristina Lichtenwald
SEO STRATEGIST & DATA ENGINEER
FOCUS: ENTITIY-BASED SEO, JSON-LD AUTOMATION, GENERATIVE SEARCH VISIBILITY, DATA-RICH SNIPPETS

The Challenge:

A legacy market leader held the #1 ranking for a primary high-intent industry keyword for over three years, relying on brand history rather than modern semantic depth.

The Objective:

Displace the incumbent and establish a sustainable “Topical Moat” that prevents counter-optimization.

The “Zero-Waste” Approach

Step 1: Semantic Mapping

Performed a gap analysis of the top 10 competitors to identify 15 specific “micro-intents” (e.g., specific operational pain points) that the market leader had neglected.

Step 2: Hub-and-Spoke Architecture

Architected a central Master Guide supported by 20 high-intent “spoke” articles.

> Why Hub-and-Spoke?
>
> It consolidates authority and reduces the need for expensive external backlink acquisition.

Step 3: Authority Funneling

Engineered an internal linking strategy that funneled 100% of the spoke’s link equity into the central hub, signaling massive topical relevance to search algorithms.

Technical Execution

Entity Density

Leveraged NLP tools to map industry entities against the competitor. We achieved a 20% higher entity density for core concepts, proving “Information Gain” to Google’s E-E-A-T signals.

Crawl Efficiency

Optimized the internal pathing so that bots could discover the entire 21-page “Moat” within two clicks of the homepage.

Results & Business Impact

Market Leadership

Secured the #1 ranking for the primary target keyword within five months.

Efficiency

Increased the overall site Share of Voice (SoV) by 25%.

ROI

Secured an organic position with an estimated PPC equivalency value of $20,000+ per month.

This and the other case studies represent Technical Proofs of Concept designed to demonstrate high-level SEO architecture, Python-driven automation, and advanced data modeling.

While the brand names and specific datasets are simulated to protect proprietary methodologies, each scenario is built on real-world logic, live SERP data, and enterprise-level growth frameworks. These case studies serve as a sandbox for testing zero-waste efficiency before deployment in live production environments.

None of the solutions of the case studies are “off the shelf.” They are custom-built to eliminate waste and demonstrate some of my knowledge.

Strategic Case Study

Engineering a High-Velocity Editorial Engine: Automation, QA, & Schema at Scale

Kristina Lichtenwald
SEO STRATEGIST & DATA ENGINEER
FOCUS: ENTITIY-BASED SEO, JSON-LD AUTOMATION, GENERATIVE SEARCH VISIBILITY, DATA-RICH SNIPPETS

The Challenge:

A high-volume B2B content strategy was suffering from manual bottlenecks, inconsistent metadata application, and slow "time-to-index," leading to missed organic opportunities.

The Objective:

Build an automated pipeline that increases publication speed while ensuring 100% technical SEO compliance across every URL.

The “Zero-Waste” Approach

Step 1: Automated SEO Briefing

Transitioned from manual research to a Python-assisted briefing process. This integrated keyword clusters, NLP entities, and internal linking targets into a single "Source of Truth" for writers.

Step 2: Technical Guardrails

Implemented automated QA checks (the "Editorial Gatekeeper") using Gumloop/Python to validate headers, image alt-text, and link health before staging.

Step 3: Dynamic Schema Injection

Engineered a scalable JSON-LD Schema generator to automatically inject Article, FAQ, and Breadcrumb markup, ensuring maximum visibility in Google Rich Results.

Metric	Legacy Process	Engineered Workflow
Review Turnaround	5 Days	4 Hours
Monthly Output	8 Articles	22 Articles
SEO Success Rate	Reactive/Patchy	100% "Born Optimized"

The “No-Touch” Technical QA Flow – from Brief Generation to Schema Validation

---

Technical Execution

API Integration

Utilized the Search Console API to trigger "Instant Indexing" requests for newly published high-priority spokes, reducing crawl latency.

Entity Optimization

Cross-referenced content against MarketMuse/Clearscope data via automated scripts to ensure every article hit a "Competitive Content Score" before the first draft was even finished.

Results & Business Impact

Velocity

Increased publication output by 40% (matching your management table stats) without adding additional headcount.

Integrity

Achieved a 0% error rate in Schema validation across all newly published assets.

Search Presence

Rapidly expanded the site's "Topical Footprint," resulting in a significant lift in non-branded organic impressions within the first 60 days.

This and the other case studies represent Technical Proofs of Concept designed to demonstrate high-level SEO architecture, Python-driven automation, and advanced data modeling.

While the brand names and specific datasets are simulated to protect proprietary methodologies, each scenario is built on real-world logic, live SERP data, and enterprise-level growth frameworks. These case studies serve as a sandbox for testing zero-waste efficiency before deployment in live production environments.

None of the solutions of the case studies are "off the shelf." They are custom-built to eliminate waste and demonstrate some of my knowledge.

Strategic Case Study

Governance, Cross-Functional Alignment, & Stakeholder Reporting

Kristina Lichtenwald
SEO STRATEGIST & DATA ENGINEER
FOCUS: ENTITIY-BASED SEO, JSON-LD AUTOMATION, GENERATIVE SEARCH VISIBILITY, DATA-RICH SNIPPETS

The Challenge:

Disconnected workflows between Marketing, Product, and Engineering led to delayed deployments, "vanity metric" reporting, and a lack of transparency regarding SEO's true ROI.

The Objective:

Establish a centralized Source of Truth and a repeatable governance framework to align SEO growth with overarching business objectives.

The "Zero-Waste" Approach

Step 1: Workflow Engineering

Integrated SEO requirements directly into Jira and Agile sprints. This moved SEO from a "reactive" afterthought to a "proactive" requirement for all product launches.

Step 2: The SOP Vault

Developed a comprehensive library of Standard Operating Procedures (SOPs). This ensured that regardless of team turnover, the technical integrity of the site remained 100% compliant.

Step 3: Executive Education

Shifted reporting from "keyword rankings" to Business Outcomes (Leads, Revenue, Market Share), creating a shared language between technical teams and leadership.

Stakeholder Group	Previous Friction	The "Unified" Solution	Business Result
Engineering	Vague SEO tickets	Jira-integrated Technical PRDs	90% Ticket Completion Rate
Editorial	Content "Review Purgatory"	Automated SEO Guardrails	40% Faster Pub Velocity
Executive	"What is SEO doing?"	Custom Revenue Attribution Dashboard	Clear ROI Correlation

---

Technical Execution

Agile/Kanban Implementation

Utilized Notion and Asana to visualize project velocity. This allowed for real-time bottleneck identification, reducing the time-to-publish for high-priority initiatives.

Data Validation

Partnered with engineering teams to validate tracking mechanisms across 5,000+ URLs, ensuring that executive-level performance reports were based on 100% clean data.

Results & Business Impact

Transparency

Reduced "misalignment friction" between departments, leading to a 40% faster deployment rate for technical SEO tickets.

Attribution

Successfully mapped organic search impact to high-value business outcomes, securing continued budget and stakeholder buy-in for long-term technical debt reduction.

Scalability

Created a "plug-and-play" framework that allowed the team to scale content production without increasing technical errors.

This and the other case studies represent Technical Proofs of Concept designed to demonstrate high-level SEO architecture, Python-driven automation, and advanced data modeling.

While the brand names and specific datasets are simulated to protect proprietary methodologies, each scenario is built on real-world logic, live SERP data, and enterprise-level growth frameworks. These case studies serve as a sandbox for testing zero-waste efficiency before deployment in live production environments.

None of the solutions of the case studies are "off the shelf." They are custom-built to eliminate waste and demonstrate some of my knowledge.

Kristina Lichtenwald

Technical SEO is an infrastructure project, not a checklist. My objective is to eliminate the technical debt that hinders organic scale and replace it with automated resilient systems. By aligning search engineering with business intelligence, I ensure every technical deployment has a direct, measurable impact on the bottom line.

Data Engineering & Code

Languages	Python (Automation/Logic), SQL (BigQuery/Queries, Regex
Analysis:	GA4 (MTA/Event Validation), GSC API, Advanced Excel (Power Query)
Environment:	GitHub (Version Control), Looker Studio (Visualization)

SEO Infrastructure

Technical:	Advanced Schema (JSON-LD), Robots.txt/XML Logic, 301 Redirect Mapping
Audit Stack:	Screaming Frog (Log File Analysis), Ahrefs, SEMrush, Botify
Health:	Core Web Vitals Optimization, Headless CMS Governance

Operational Governance

Workflows:	Jira/Agile Frameworks, Kanban Methodology
Platforms:	WordPress, Elementor, Shopify, Contentful, Magento
Strategy:	Entity Mapping, Topical Authority Moats, Content Lifecycle SOPs

Let’s Build the Future of Search Together

W: wkdkristina.github.io

L: linkedin.com/in/klichtenwald

E: kmlichtenwald@gmail.com