This n8n workflow automatically researches a website, generates 300+ keywords, categorizes them into Pillars & Clusters, enriches with SEO metrics, prioritizes, and delivers a comprehensive Google Sheet report via email.

**Prerequisites & API Requirements**

### **Required Services & Credentials:**

1. **OpenAI API** (for AI analysis & categorization)
   * Get key:<https://platform.openai.com/api-keys>
   * Model used: gpt-4o-mini
   * Cost: ~$0.10-0.30 per workflow run
2. **SerpAPI** (for keyword research & PAA)
   * Get key:<https://serpapi.com/>
   * Free tier: 100 searches/month
   * Alternative: Use DataForSEO SERP API
3. **DataForSEO API** (for search volume & keyword difficulty)
   * Get credentials:<https://dataforseo.com/>
   * Required endpoint: /v3/keywords\_data/google\_ads/search\_volume/live
   * Free trial: $1 credit (enough for testing)
   * Alternative: Use SEMrush API or Ahrefs API
4. **Google Sheets API** (OAuth2)
   * Enable in Google Cloud Console
   * Create OAuth2 credentials
   * Connect in n8n: Settings > Credentials > Google OAuth2
5. **Gmail API** (OAuth2)
   * Same Google Cloud project as Sheets
   * Enable Gmail API
   * Connect in n8n with same OAuth2 credential

## **Installation Steps**

### **Step 1: Import Workflow**

1. Copy the complete JSON workflow
2. In n8n: Click **"+"** > **"Import from File/URL"**
3. Paste JSON and click Import

### **Step 2: Configure Credentials**

#### **OpenAI:**

1. Go to node: "OpenAI - Analysis"
2. Click **"Credential to connect with"**
3. Add new OpenAI credential
4. Paste API key
5. Repeat for "OpenAI - Seeds" and "OpenAI - Categorize"

#### **DataForSEO:**

1. Go to node: "Get Volume & Difficulty"
2. Authentication: **HTTP Basic Auth**
3. Username: Your DataForSEO email
4. Password: Your DataForSEO password

#### **Google Sheets & Gmail:**

1. Create OAuth2 credentials in Google Cloud Console
2. In n8n, add Google OAuth2 credential
3. Authorize with your Google account
4. Apply to all Google Sheets and Gmail nodes

### **Step 3: Activate Workflow**

1. Click **"Active"** toggle in top-right
2. Copy the webhook URL (Production URL)

## **📊 Workflow Architecture**

### **Phase 1: Crawling & Analysis (Nodes 1-7)**

Webhook → Fetch Homepage → Extract Links → Crawl Pages

→ Aggregate Content → AI Analysis → Generate Seeds

### **Phase 2: Keyword Expansion (Nodes 8-13)**

Parse Seeds → Batch → SERP Lookup → Extract Related

→ Rate Limit → Loop → Merge All

### **Phase 3: Enrichment (Nodes 14-20)**

Deduplicate → Batch → Get Metrics (Volume/KD)

→ Parse → Rate Limit → Loop → Merge → Filter Zero Volume

### **Phase 4: Categorization (Nodes 21-23)**

AI Categorization → Merge Data → Calculate Priority Score

### **Phase 5: Report Generation (Nodes 24-30)**

Create Sheet → Write Keywords → Generate Summaries

→ Write Tabs → Send Email

## **Expected Output**

### **Google Sheet Structure:**

#### **Tab 1: All Keywords**

| **Column** | **Description** |
| --- | --- |
| keyword | The keyword phrase |
| pillar | High-level theme (5-8 total) |
| cluster | Subtopic under pillar |
| intent | Informational/Commercial/Transactional/Navigational |
| search\_volume | Monthly searches |
| keyword\_difficulty | 0-100 scale |
| priority\_score | Calculated: (Vol/100) \* (100-KD)/50 |
| source\_type | seed/related\_search/paa/suggestion |
| competition | low/medium/high |
| cpc | Cost per click (if available) |
| notes | Recommended content angle |

#### **Tab 2: Top by Pillar**

Top 15 keywords per pillar, sorted by priority score

#### **Tab 3: Quick Wins**

Keywords with:

* Volume ≥ 500
* Keyword Difficulty ≤ 40
* Sorted by priority

#### **Tab 4: Content Map**

| **Pillar** | **Cluster** | **Keyword Count** | **Avg Volume** | **Suggested Page Type** |
| --- | --- | --- | --- | --- |
| ... | ... | ... | ... | Hub Page / Single Article |

## **Running the Workflow**

### **Via Webhook (Production):**

bash

curl -X POST https://your-n8n-instance.com/webhook/seo-research-webhook \

-H "Content-Type: application/json" \

-d '{

"Website URL": "https://example.com",

"Recipient Email": "client@example.com"

}'

### **Via Form (User-Friendly):**

1. Visit the webhook URL in browser
2. Fill in the form:
   * Website URL: Full URL with https://
   * Recipient Email: Where to send report
3. Click Submit
4. Wait 5-15 minutes for completion

## **Performance & Costs**

### **Execution Time:**

* **Small site (<50 keywords):** 5-8 minutes
* **Medium site (200-300 keywords):** 10-15 minutes
* **Large site (500+ keywords):** 20-30 minutes

### **API Costs per Run:**

* OpenAI: $0.10-0.30
* SerpAPI: 5-10 credits
* DataForSEO: $0.10-0.50
* **Total: ~$0.30-1.00 per workflow**

### **Rate Limits:**

* SERP API: 5 requests/batch, 2s delay = ~150/hour
* DataForSEO: 10 keywords/batch, 1s delay = ~600/hour