

Project Report: Smart Job Scraping Automation Using AI and n8n

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Project Type: AI-Powered Job Discovery Automation

Platform: n8n (No-Code Automation), Google Gemini, JSearch API, Google Sheets

Introduction: The Problem Behind Job Hunting

In the age of digital transformation, job seekers still rely on traditional, time-consuming methods to find relevant jobs. Most professionals search for jobs manually using basic keywords, visit multiple job portals daily, and try to identify whether a job suits their profile. However, this leads to:

- Missed opportunities due to vague or inaccurate keywords
- Wasted time browsing irrelevant job postings
- Confusion while analyzing job descriptions manually
- Lack of understanding about ATS (Applicant Tracking System) filters
- No clarity on which of their projects align with a job role

This project solves all the above problems using a no-code automation platform (**n8n**) combined with powerful AI (**Google Gemini**) to build a smart job recommendation engine that is scalable, efficient, and personalized.

Goal of the Project

To automate the end-to-end process of job discovery, filtering, and personalization using a combination of AI, APIs, and automation workflows.

Key Objectives:

- Eliminate manual job searches
 - Extract and suggest ATS-friendly keywords
 - Recommend job-specific matched projects from a portfolio
 - Store job data in a clean, structured format
 - Help users focus only on high-quality and relevant opportunities
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Manual Job Search: Traditional vs. Smart Automation

Traditional Manual Process

1. Go to job platforms (e.g., Naukri, LinkedIn, Indeed)
2. Type a basic job role like "Data Analyst"

3. Scan through pages of job listings
4. Read each job description individually
5. Manually identify skills required
6. Check if their experience or projects match
7. Copy job details into Excel or Notepad

Challenges:

- Repetitive and slow
 - High risk of missing relevant roles
 - No keyword optimization for ATS
 - No automated project-job mapping
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Automated Smart Process (Our Workflow)

1. **User inputs a job role** (e.g., "Data Analyst")
 2. **Google Gemini** expands it into 10+ related job titles
 3. **JSearch API** scrapes job listings for these titles from RapidAPI
 4. Job listings are **split individually** and sent to Gemini AI
 5. AI extracts **ATS keywords**, writes a **recruiter-style comment**, and matches the job with projects
 6. **Merged data** (original job + AI insights) is saved to **Google Sheets**
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Step-by-Step Workflow: From Input to Output

Step 1: Manual Trigger

- **Type:** Trigger Node
- **Purpose:** Start the workflow manually during testing or setup

Step 2: Set Job Role

- **Type:** Set Node
- **Input Variable:** role_name = "Data Analyst"
- **Purpose:** Define target job for automation

Step 3: Generate Job Titles (Google Gemini)

- **Type:** AI Prompt via HTTP Request
- **Purpose:** Get all job title variations using Gemini

- **Example Output:**

- Data Analyst
- Product Analyst
- BI Developer
- Reporting Analyst

✅ **Step 4: Job Scraping (JSearch API)**

- **Type:** HTTP Request
- **Source:** RapidAPI (JSearch)
- **Filters:**
 - Country: India
 - Employment: FULLTIME, INTERN
 - Date: Posted Today

✅ **Step 5: Split Job Listings**

- **Type:** Split In Batches
- **Purpose:** Process each job separately

✅ **Step 6: Analyze with Gemini AI**

- **Type:** AI Agent via HTTP Request
- **Prompt:**
 - Extract 10–15 keywords
 - Recommend candidate profile
 - Match job with user portfolio
- **AI Output Format (Structured JSON):**

```
{  
  "ID": "job_id",  
  "key_words": [...],  
  "talent_manager_comment": "...",  
  "relevant_projects": [  
    {"Project Name": "...", "Course": "..."}  
  ]  
}
```

✅ Step 7: Merge Node

- **Mode:** Combine by Matching Fields
- **Fields to Match:** job_id and output.ID
- **Purpose:** Merge AI response with original job data

✅ Step 8: Google Sheets Output

- **Mapped Fields:**
 - Job Title, Company Name, Apply Link
 - AI-generated Keywords
 - Recruiter-style Feedback
 - Matched Projects
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🚀 Why This Project Matters

💛 For Job Seekers

- Eliminates guesswork and improves search quality
- Saves 5–8 hours weekly
- Increases chances of shortlisting with ATS-optimized resumes
- Boosts confidence with tailored role recommendations

🌟 For Portfolio Showcasing

- Smart project-to-job matching proves relevance
- Shows depth of personal project work during interviews

⚡ For Career Growth

- Helps discover roles you never knew matched your skill set
 - Learns from your inputs (via CSV projects) and improves accuracy
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📄 Real Attachments Reviewed & Utilized

- ✅ PPT Presentation: Explained workflow with visuals and objectives
 - ✅ PDF & DOCX Guide: Step-by-step building instructions
 - ✅ CSV Portfolio Files: Used for matching with jobs
 - ✅ RapidAPI Signup Guide: Included for easy onboarding
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Results

Metric	Impact
Manual time saved	5–8 hours/week
ATS compatibility	Improved through AI keyword logic
Personalization	Project-based job matching
Data centralization	All stored in Google Sheets
User confidence	Increased through AI feedback

Future Enhancements

- Auto-email job matches to user
 - Add filters by location, remote, company, etc.
 - Translate Gemini output to local languages
 - Create a web dashboard for job tracking and filtering
 - Integrate resume scoring based on ATS match
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Final Thoughts

This project demonstrates how no-code platforms like n8n, when combined with advanced AI (Gemini), can solve real-life problems in a smarter, scalable way. It highlights your ability to:

- Automate manual workflows
- Think like both a user and a developer
- Integrate APIs and data
- Use AI for practical, impactful use cases

It's a great addition to your portfolio and an impressive project to discuss in interviews.

Prepared by: Sachin Savkare

Purpose: For learning showcase, GitHub portfolio, and interview discussions