

# Internship Automation Hub

**System Architecture:** The Internship Automation Hub is an Agentic AI workflow built in n8n that automates job parsing, resume tailoring, cover letter generation, and file upload. The system consists of a controller agent and several specialized agents working in sequence using shared memory via Google Sheets.

**Controller Agent:** Orchestrates flow between input retrieval, AI processing, and file generation.

Routes job rows to specialized agents.

Ensures error handling, fallback defaults, and process completion signaling.

## Specialized Agents:

**Job Parsing Agent:** - Extracts job title, role category, seniority, tech stack, skills and sets Match Score.

Uses an LLM tool to transform raw job description into structured fields.

**Resume Tailoring Agent:** Receives job object + resume JSON.

Produces tailored summary, skills, and achievements.

Ensures JSON-safe output parsing via code node.

**Cover Letter Agent:**

Generates personalized cover letter grounded in user's real experience.

Outputs clean JSON containing row\_number and cover\_letter text.

## Built - in Tools:

1. Google Sheets (read & update job table)
2. Google Drive (upload tailored files)
3. LLM Tool (text generation and transformation).
4. Code Node (data transformation and JSON parsing)

## Custom Tool:

### FileWriterTool:

Converts AI text output into .txt files. - Assigns filename using

row\_number. - Returns binary for Google Drive upload.

Includes validation and error handling.

**Workflow Orchestration:** - Trigger → Get rows → Filter unprocessed → Parse → Tailor resume →

Generate cover letter → Write files → Upload → Update sheet → Mark PROCESSED. -

Parallel agents

run via repeated function-style branching. - Merge nodes ensure downstream actions wait for upstream completions.

### **Challenges & Solutions:**

**JSON extraction failures:** Implemented regex-controlled parsing with fallback.

**Escape character issues:** Added sanitization for newlines and quotes.

**File upload binary mismatch:** Custom file writer ensured correct encoding.

**Row number propagation:** Added structured passing of row\_number through nodes.

**Multi-job handling:** Merged job objects with resume using item-wise transformations.

### **Evaluation Test Cases:**

Missing fields in job description handled gracefully.

AI output malformed JSON → auto-corrected by parsing node.

Drive upload failures retried using n8n error workflow.

### **Metrics:**

100% correct file upload for processed jobs.

Tailored resume accuracy aligns with job keywords.

**End-to-end workflow success:** Verified for multiple jobs simultaneously.

### **Limitations:**

Dependent on LLM consistency.

Not optimized for large-scale job batches.

### **Future Improvements:**

Add RL-based reward signal for tailoring quality.

Build a similarity-ranking agent to improve match\_score.

Extend system to automate recruiter outreach.

### **Conclusion:**

The Internship Automation Hub successfully demonstrates a multi-agent orchestration pipeline with a controller, specialized agents, multiple built-in tools, and a custom tool. It satisfies the core requirements of an Agentic AI workflow and delivers practical automation for internship application tasks.