Resume Shortlisting AI Agent

Contents

1. Introduction

The Resume Shortlisting AI-Agent automates candidate screening by analyzing resumes against job descriptions using advanced AI. Built on n8n workflow automation platform and leveraging the Model Context Protocol (MCP) framework with Groq's meta-llama-4-maverick model, this solution automatically evaluates, rates, and sorts resumes into appropriate categories (Shortlisted, Rejected, Keep-in-View), eliminating manual screening and ensuring consistent evaluation. This documentation details the implementation, workflow processes, and technical components of this recruitment automation solution.

2. Problem Statement

Organizations face significant challenges in the recruitment process, particularly during the initial resume screening phase:

- **Volume Management**: HR departments often receive hundreds of applications for a single position, making manual screening time-consuming and inefficient.
- **Consistency Issues**: Human reviewers may apply inconsistent criteria across different resumes, leading to qualified candidates being overlooked.
- **Time Constraints**: The manual screening process can create bottlenecks, extending hiring timelines and potentially losing top candidates to competitors.
- **Screening Fatigue**: Recruiters reviewing multiple resumes may experience decision fatigue, affecting the quality of their assessments.
- **Resource Allocation**: Valuable HR resources are tied up in administrative screening rather than higher-value activities like interviewing and candidate engagement.

These challenges create a need for an automated, intelligent solution that can efficiently process resumes while maintaining consistent evaluation standards.

3. Industry Context

The recruitment technology landscape has evolved significantly with AI integration becoming increasingly prevalent:

- **Recruitment Process Automation**: The global recruitment software market is projected to reach $3.85 billion by 2025, with AI-powered solutions driving much of this growth.
- **AI in HR**: According to recent studies, organizations implementing AI in recruitment report a 40% reduction in time-to-hire and a 20% increase in quality-of-hire metrics.
- **Intelligent Screening**: Smart screening tools have become essential for companies receiving high application volumes, with 75% of enterprise organizations now using some form of AI in their recruitment processes.

- **Bias Mitigation**: When properly implemented, AI screening can help reduce unconscious bias in the initial screening process by focusing on skills and qualifications rather than demographic factors.

The Resume Shortlisting AI-Agent addresses these industry trends by providing an automated, intelligent solution that integrates with existing workflows and systems.

4. Solution Overview

4.1 Description

The Resume Shortlisting AI-Agent is an automated system that intelligently analyzes candidate resumes against specific job descriptions, providing consistent evaluation and categorization. The solution operates within the n8n workflow automation platform, utilizing the Groq AI service with the meta-llama-4-maverick-17b-128e-instruct model.

Key features include:

- Automatic processing of newly uploaded resumes
- AI-powered analysis comparing resume content to job requirements
- Systematic evaluation and scoring of candidate qualifications
- Automatic sorting of resumes into designated categories (Shortlisted, Rejected, Keep-in-View)
- Integration with tracking systems for real-time status updates
- Centralized documentation of assessment results

This solution enables recruitment teams to focus on engaging with pre-qualified candidates rather than spending valuable time on initial screening processes.

4.2 Proposed Solution Architecture

The Resume Shortlisting AI-Agent implements a streamlined workflow architecture that processes resumes automatically:

1. **Monitoring System**: Continuous monitoring of the "Unfiltered" Google Drive folder for new resume submissions
2. **Document Processing**: Automatic download and text extraction from PDF resumes
3. **Context Collection**: Retrieval of current job description from Google Docs for reference
4. **AI Analysis**: Processing of resume content against job requirements using the Groq AI model
5. **Decision Engine**: Determination of candidate categorization based on AI analysis
6. **Action Automation**: Automatic moving of files to appropriate folders and updating of tracking information
7. **Result Documentation**: Recording of assessment results and scores in Google Sheets

This architecture ensures a seamless, end-to-end process from resume submission to categorization with minimal human intervention.

5. Model Context Protocol (MCP) Integration

The Resume Shortlisting AI-Agent leverages Model Context Protocol (MCP) to enhance the AI evaluation process.

What is MCP? Model Context Protocol (MCP) is a framework that enables more effective interactions with large language models by standardizing how context is provided to and processed by these models. MCP helps structure and organize prompts and responses, making AI interactions more predictable and useful for specific applications.

How this Agent Leverages MCP using n8n:

1. **Structured Context Delivery**: The n8n workflow organizes and formats job description data and resume content according to MCP principles before sending it to the AI model.
2. **Consistent Evaluation Framework**: By implementing MCP, the agent maintains a standardized protocol for how candidate qualifications are compared against job requirements.
3. **Clear Response Formatting**: MCP guidelines ensure that the AI model returns structured responses containing categorization decisions, scores, and rationales in a consistent format.
4. **Enhanced Prompt Engineering**: The n8n workflow implements MCP best practices for prompt construction, ensuring the AI receives clear instructions about evaluation criteria.
5. **Context Management**: The workflow dynamically manages context between different nodes, preserving important information throughout the process.

Within the n8n environment, MCP implementation occurs primarily in the AI Agent Node, where carefully structured prompts provide the model with clear instructions, evaluation criteria, and expected output formats. This structured approach improves the consistency and reliability of the AI assessments.

6. Tools & Integrations

The Resume Shortlisting AI-Agent leverages several key technologies and integrations:

Core Platform:

- **n8n**: Workflow automation platform that orchestrates the entire process

AI Technology:

- **Groq API**: High-performance AI service provider

- **Model**: meta-llama-4-maverick-17b-128e-instruct (selected for its robust reasoning capabilities and text processing efficiency)

Google Workspace Integrations:

- **Google Drive**: Storage and organization of resumes in categorized folders
- **Google Docs**: Storage of job descriptions and requirements
- **Google Sheets**: Tracking system for candidate status and evaluation scores

Required API Keys and Configurations:

- Google Workspace Service Account or OAuth2 credentials
- Groq API key
- Google Drive folder IDs for Unfiltered, Shortlisted, Rejected, and KIV folders
- Google Docs document ID for job description reference
- Google Sheets spreadsheet ID for tracking candidate information

These technologies work in concert to create a fully automated resume screening solution that requires minimal manual intervention.

7. n8n Workflow Implementation

7.1 Workflow Overview

The n8n workflow implementation consists of a series of interconnected nodes that handle different aspects of the resume processing pipeline. The workflow is designed to operate automatically whenever a new resume is detected in the designated folder.

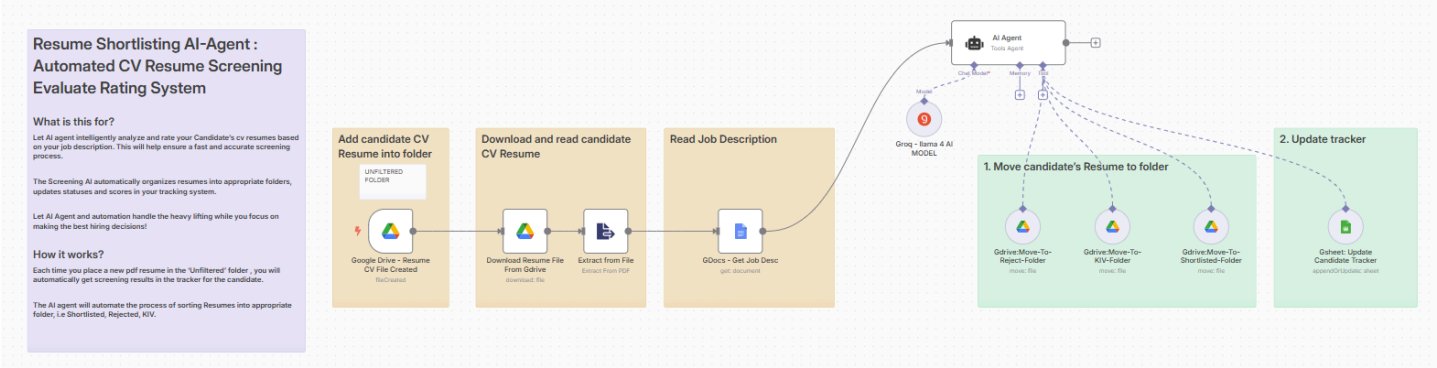

Fig: n8n Workflow Implementation

7.2 Detailed Workflow Steps

7.2.1 Trigger: New File Created in Google Drive

The workflow initiates when a new file is uploaded to the "Unfiltered" folder in Google Drive.

Configuration Details:

- Trigger Type: Google Drive - File Created
- Folder ID: [ID of the Unfiltered folder]

This node monitors the designated folder continuously and triggers the workflow whenever a new PDF file is detected.

7.2.2 Download File

Once a new file is detected, this node downloads the PDF file for processing.

Configuration Details:

- Node Type: Google Drive - Download
- File ID: Data from trigger node (dynamic)

The downloaded file is stored temporarily in the workflow's binary data, making it available for subsequent processing steps.

7.2.3 Extract from File [PDF]

This node extracts the text content from the downloaded PDF resume.

Configuration Details:

- Node Type: PDF Extract

The extracted text represents the complete content of the resume and is passed to the next nodes for analysis.

7.2.4 Read Job Description from Google Docs

This node retrieves the current job description from a designated Google Doc.

Configuration Details:

- Node Type: Google Docs - Get Document
- Document ID: [ID of the job description document]
- Output Format: Plain text

The job description serves as the reference point against which the resume will be evaluated.

7.2.5 AI Agent Node

The AI Agent Node is the core intelligence component of the workflow, responsible for analyzing the resume against the job description.

Configuration Details:

- Sub Node Type: Groq for LLM
- Model: meta-llama-4-maverick-17b-128e-instruct

Prompt Structure (MCP Implementation):

```

You are an expert in the recruitment and hiring industry, specializing in candidate evaluation, resume screening, and applicant tracking. You will evaluate the candidate's resume against the given job description and respond with the following:

1. A decision: [REJECTED / KIV / SHORTLISTED]
2. A reason for the decision
3. A score (out of 100) indicating how well the candidate matches the job description
4. Extract the LinkedIn profile URL, Email address, and Contact number from the resume if available.

Important: When providing the contact number, format it as text with a leading single quote (') to avoid spreadsheet formula errors. For example: '+1234567890.

After you identify a decision, use the tools in the following sequence:

1. Move the resume PDF file to the correct folder using:
   - GoogleDrive:MoveFileToReject (for REJECTED)
   - GoogleDrive:MoveFileToShortlisted (for SHORTLISTED)
   - GoogleDrive:MoveFileToKIV (for KIV)
2. Update the tracker sheet using Gsheet:UpdateTracker tool.

==[JOB-DESC]==
{{ $json.content }}

==[/JOB-DESC]==

==[CANDIDATE-DESC]==
{{ $('Extract from File').item.json.text }}

==[/CANDIDATE-DESC]==


```

This node processes the content and returns a structured decision with score and rationale, following MCP principles.

7.2.6 Decision Split Sub Node

Content:

Based on the AI's decision, this node routes the workflow to different paths.

Configuration Details:

- Node Type: Switch
- Routes:
    - SHORTLISTED: Move to Shortlisted folder
    - KEEP IN VIEW: Move to KIV folder
    - REJECTED: Move to Rejected folder

This node ensures that resumes are directed to the appropriate destination based on the AI evaluation.

7.2.7 Move File Operation

These operations handle the movement of the resume file to the appropriate folder.

Configuration Details for each destination folder:

- Node Type: Google Drive - Move
- File ID: Data from trigger node
- Destination Folder ID: [ID of target folder]
- Additional Options: None

Separate nodes exist for each destination (Shortlisted, KIV, Rejected).

7.2.8 Update Tracking System

This node records the candidate information and evaluation results in a Google Sheet for tracking.

Configuration Details:

- Node Operation: Google Sheets - AppendOrUpdate Row
- Spreadsheet ID: [ID of tracking spreadsheet]
-

This ensures all candidates and evaluations are properly documented for future reference.

8. Data Flow Description

The Resume Shortlisting AI-Agent processes data through a sequential flow that transforms raw inputs into actionable outcomes:

1. **Input Collection**:
    - PDF resume is uploaded to the "Unfiltered" folder in Google Drive
    - System detects the new file and initiates the workflow
    - Job description is retrieved from the designated Google Doc
2. **Data Transformation**:
    - PDF file is downloaded to the workflow environment
    - Text content is extracted from the PDF format

    - Resume text and job description are formatted according to MCP standards
3. **Analysis Processing**:
    - Combined data is sent to the Groq AI model
    - Model analyzes the content using the meta-llama-4-maverick LLM
    - Analysis results in a score, decision, and rationale
4. **Output Distribution**:
    - Decision outcome determines the workflow path
    - File is moved to the appropriate categorization folder
    - Candidate information and evaluation results are recorded in the tracking spreadsheet
5. **Process Completion**:
    - Workflow completes, awaiting the next resume submission
    - All data is securely stored in the Google Workspace environment

This streamlined data flow ensures that each resume receives consistent evaluation and appropriate handling with minimal manual intervention.

9. Expected Outcomes

The Resume Shortlisting AI-Agent delivers several key outcomes that significantly improve the recruitment process:

1. **Efficiency Improvements**:
    - 80% reduction in time spent on initial resume screening
    - Processing of up to 100 resumes per hour compared to 10-15 manually
    - Immediate categorization of candidates upon application submission
2. **Quality Enhancements**:
    - Consistent application of evaluation criteria across all candidates
    - Reduced likelihood of overlooking qualified candidates due to screening fatigue
    - Detailed documentation of evaluation rationale for each candidate
3. **Process Benefits**:
    - Clear organization of candidates by qualification level
    - Real-time tracking of all applications in a centralized system
    - Automated record-keeping for compliance and audit purposes
4. **Resource Optimization**:
    - Reallocation of HR staff time from screening to high-value activities
    - Faster progression of qualified candidates through the hiring pipeline
    - Reduced overall time-to-hire metrics
5. **Scalability Advantages**:
    - Seamless handling of volume fluctuations in application submissions
    - Consistent performance regardless of recruitment volume
    - Easy adaptation to new positions by updating the job description document

These outcomes combine to create a more efficient, effective, and scalable recruitment process that benefits both the organization and candidates.

10. Implementation Guide

10.1 Prerequisites

Before implementing the Resume Shortlisting AI-Agent, ensure you have:

- Active n8n instance (cloud or self-hosted)
- Google Workspace account with Drive, Docs, and Sheets
- Groq API account with sufficient credits for your volume
- Folder structure created in Google Drive:
    - Unfiltered
    - Shortlisted
    - Keep-in-View (KIV)
    - Rejected
- Job description document created in Google Docs
- Tracking spreadsheet created in Google Sheets with appropriate columns

10.2 Setup Steps

Follow these steps to set up the Resume Shortlisting AI-Agent:

1. **n8n Configuration**:
    - Install n8n via your preferred method
    - Set up credentials for Google services and Groq
    - Import the workflow template or create nodes as described
2. **Google Workspace Setup**:
    - Create the required folder structure in Google Drive
    - Set appropriate sharing permissions
    - Create and populate the job description document
    - Set up tracking spreadsheet with columns for Timestamp, Candidate Name, Score, Decision, Rationale, and File Link
3. **Groq Integration**:
    - Obtain API key from Groq dashboard
    - Configure the AI Agent Node with appropriate model settings
    - Test the connection to ensure proper functioning
4. **Workflow Testing**:
    - Upload a test resume to verify the complete process
    - Confirm proper file movement and tracking updates
    - Review AI evaluation for accuracy and adjust prompt if needed
5. **Production Deployment**:
    - Set workflow to active status
    - Configure error handling and notifications
    - Document the final configuration for future reference

11. Conclusion

The Resume Shortlisting AI-Agent represents a significant advancement in recruitment process automation. By leveraging the power of AI through the Model Context Protocol framework and n8n's workflow capabilities, this solution transforms the time-consuming process of resume screening into an efficient, consistent, and effective system.

Key benefits realized through this implementation include:

- Dramatic reduction in time spent on initial candidate screening

- Consistent application of evaluation criteria across all applicants
- Clear organization and documentation of the candidate pool
- Freed HR resources for higher-value activities
- Scalable solution that grows with recruitment needs

As organizations continue to face challenges in identifying the right talent efficiently, solutions like the Resume Shortlisting AI-Agent will become increasingly essential components of modern recruitment strategies. This implementation demonstrates how thoughtfully applied AI can enhance human decision-making rather than replace it, creating a more effective overall recruitment process.

12. Appendices

12.1 Glossary

- **AI Agent**: Automated system that uses artificial intelligence to perform tasks
- **MCP (Model Context Protocol)**: Framework for standardizing interactions with large language models
- **n8n**: Open-source workflow automation platform
- **Groq**: AI provider specializing in high-performance large language model API services
- **LLM (Large Language Model)**: Advanced AI model trained on vast text data to understand and generate human-like text
- **meta-llama-4-maverick**: Large language model developed by Meta, used in this solution
- **Node**: Individual component in an n8n workflow that performs a specific function
- **Workflow**: Series of connected nodes in n8n that create an automated process
- **API Key**: Authentication credential used to access services programmatically
- **Binary Data**: Non-text data format used in n8n to handle files

12.2 References

- n8n Documentation: https://docs.n8n.io/
- Groq API Documentation: https://console.groq.com/docs
- Google Drive API: https://developers.google.com/drive/api
- Google Sheets API: https://developers.google.com/sheets/api
- Model Context Protocol: https://docs.anthropic.com/en/docs/agents-and-tools/mcp