AI-Powered Meme Automation for Social Media

Thispresentation outlinesthe developmentofan AI-based automated systemdesigned totransformpersonalphotos into shareable meme images with humorous, relevant captions, and optionally post them to Instagram.

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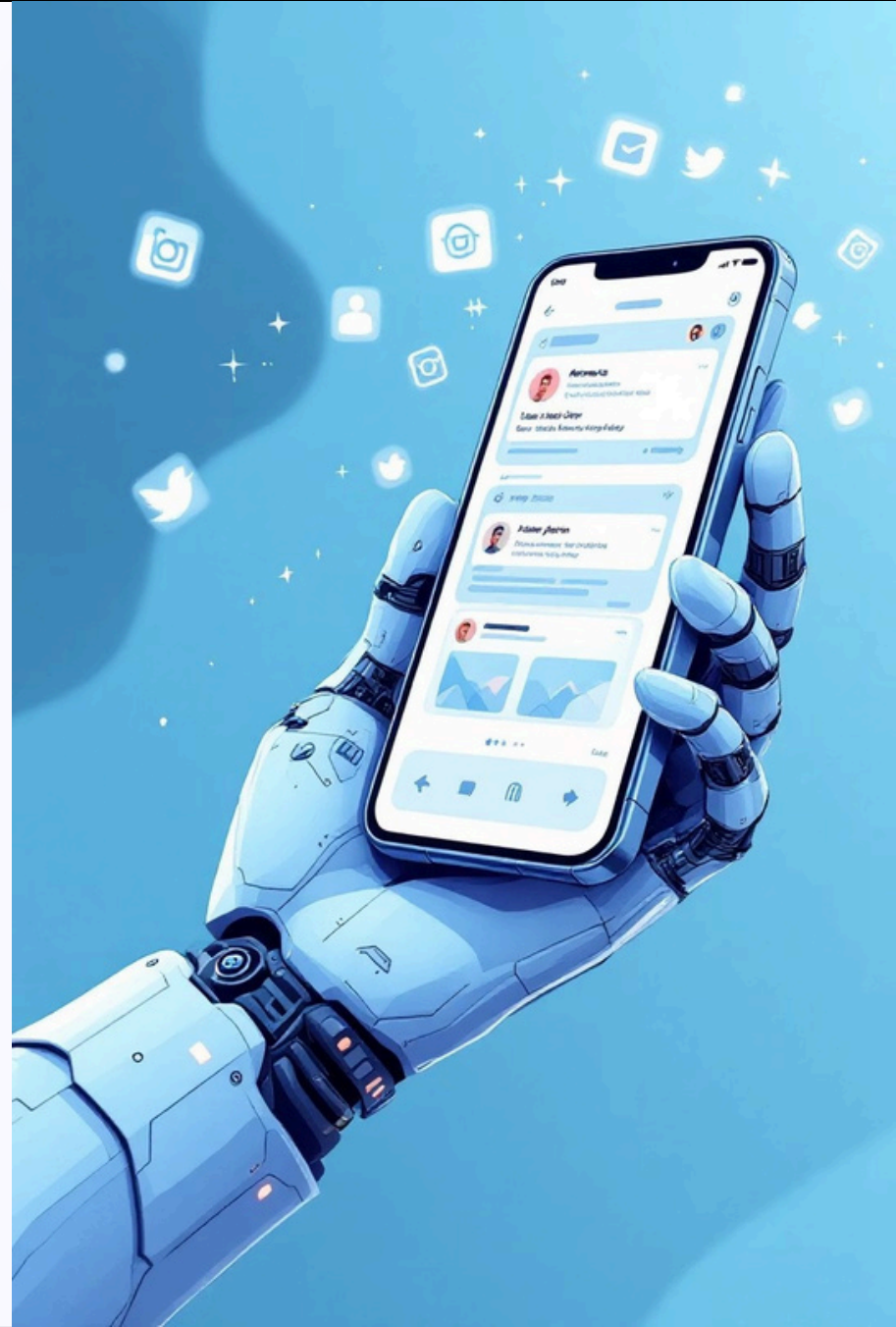


Project Overview: From Photo to Viral Meme

Photo Transformation

Convert personal photos into classic meme formats.

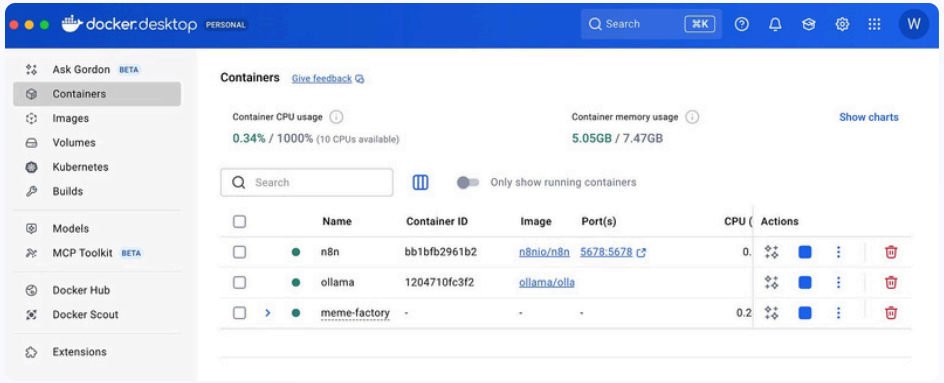
Automated Captioning

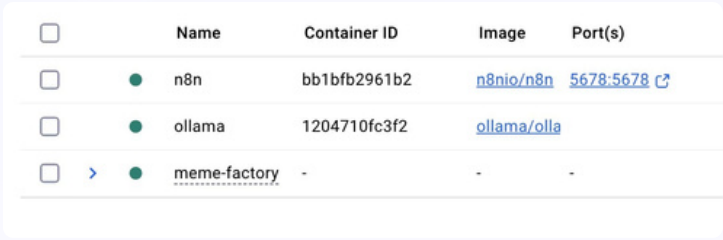
Generate humorousand relevant captions using advanced AI.

Social Sharing

Optionalpostingto platforms like Instagram, streamlining content creation.

Core System Functionalities: The Meme Generation Pipeline





01

Automatic Photo Selection

Daily at 9 AM,thesystemfetchesten random photos from the last seven days via Google Drive API.

02

Image Analysis & Humor Assessment

Localvisualmodels (e.g.,Qwen2-VL-2B) analyze photos for humor potential, filtering for a "meme potential score" above 7.

03

Humorous Caption Generation

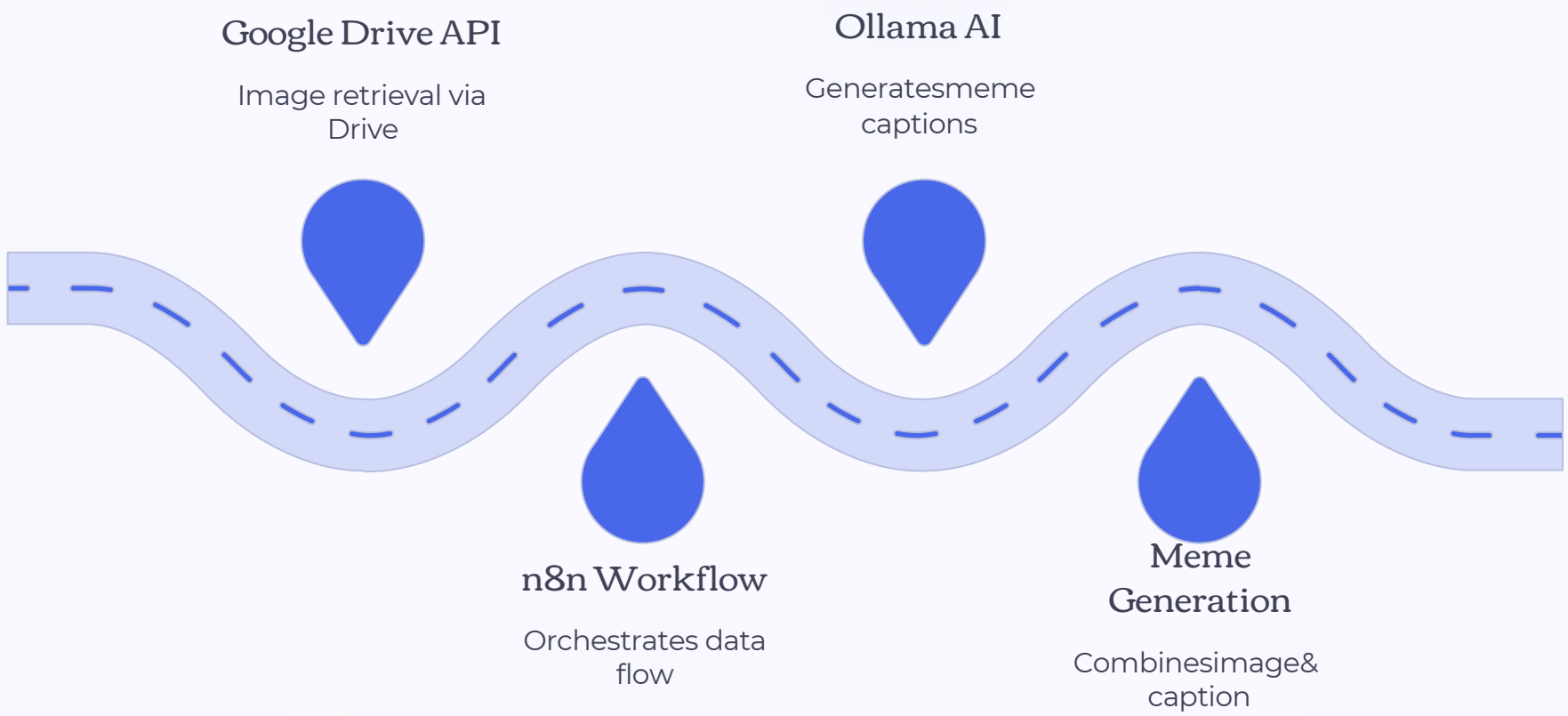
Mistral 7B(Ollama)generatesfiveGen-Z style captions, with AI selecting the best one.

04

Meme Image Creation

Python PILoverlaysthechosen caption in Impact font on a 1080x1080 image, ready for sharing.

System Architecture: Integrating Key Technologies



The system leverages a robust Docker-based environment, orchestrating n8n for workflow automation, Ollama for local AI models, and Google Drive for image retrieval.

High-Level Workflow: From Trigger to Post

Daily Trigger

Scheduledexecution at 9 AM.

Photo Acquisition

RetrievingphotosfromGoogle Drive.

Visual Analysis

OllamaVisionassesses meme potential.

Caption Generation

Ollama LLM crafts witty text.

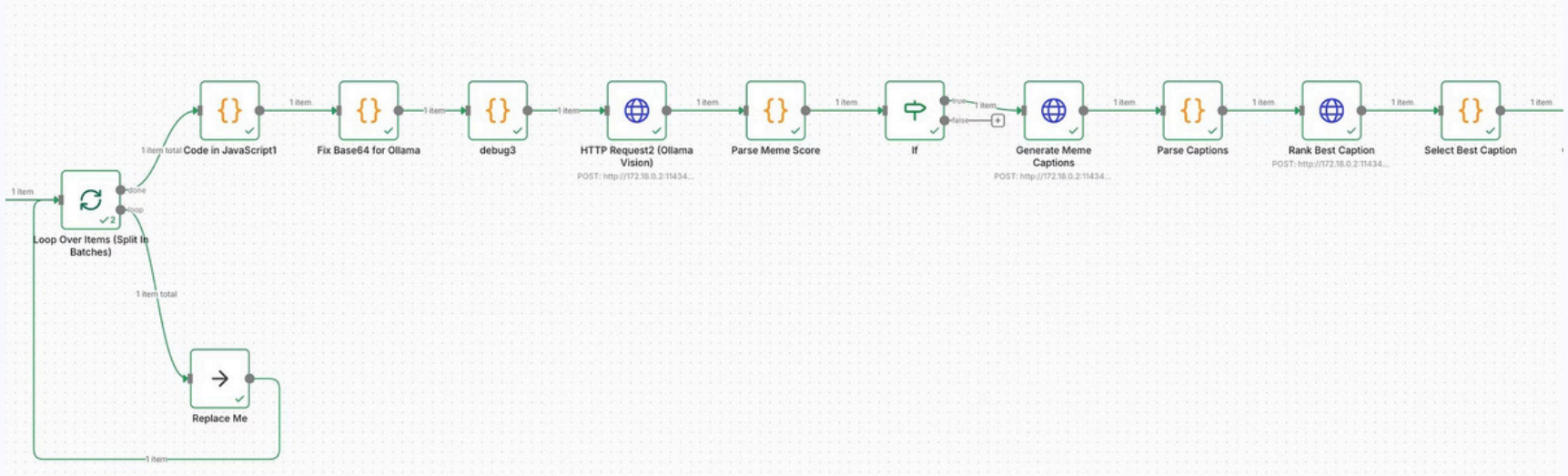
Meme Creation

PILgeneratesthefinal image.

Optional Posting

SharetoInstagramorlog to Sheets.

Technical Details: Photo Selection & Analysis in n8n



Ollama Vision Models

UtilizingmodelslikeQwen2-VL-2B or LLaVA-Phi3 to meticulously analyze visual elements such as scenes, facial expressions, and actions within each photo.

Meme Potential Scoring

Analgorithmcalculatesa"meme potential score" (1-10) to ensure only highly suitable images are processed, filtering out less engaging content.

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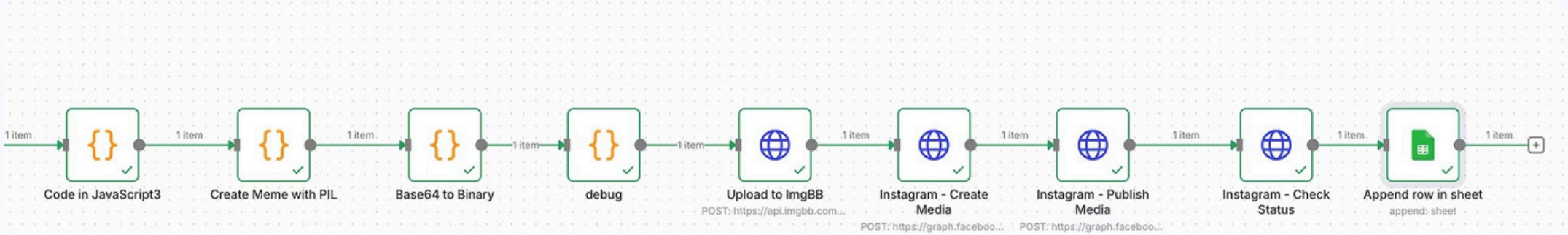


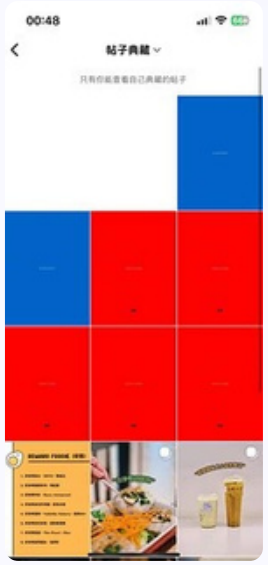
- Daily Selector: Manages fetching and initial processing of photos.
- Meme Pipeline: The core workflow for analysis, captioning, and image creation.
- Posting Scheduler: Handles optional social media integration and logging.

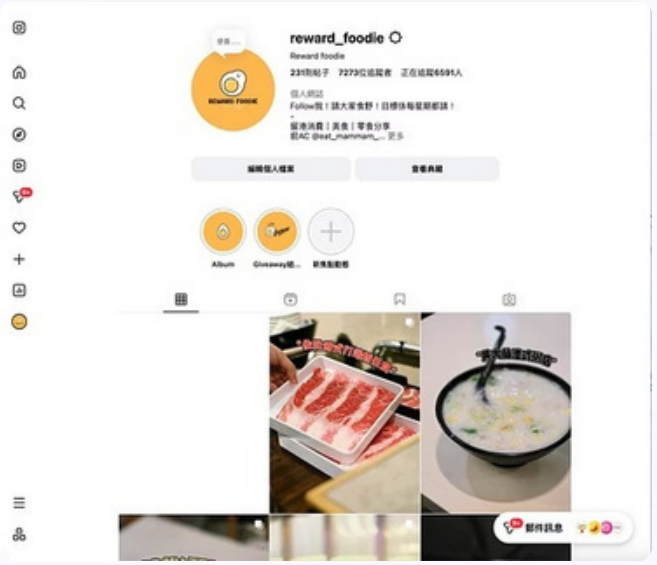
Challenges & Innovative Solutions

Privacy Concerns with Google Photos

Initial privacy issueswith GooglePhotos

API necessitated a swift transition to Google Drive for secure and compliant photo access.





Instagram API Instability

Frequent errorswiththeInstagram API required implementing robust error handling and continuous monitoring within n8n and through terminal checks, ensuring reliable posting.

Technical Implementation: A Unified Docker Ecosystem

Theentireprojectis deployedwithinaDocker environment,utilizingopen-sourcetechnologies toachievefullautomation andseamlessintegration.

Docker

Containerization for consistent and isolated environments.

n8n

The central workflow automation tool orchestrating all processes.

Ollama

Platform for running local AI models (LLM and Vision).

Python PIL

Image manipulation for meme creation.