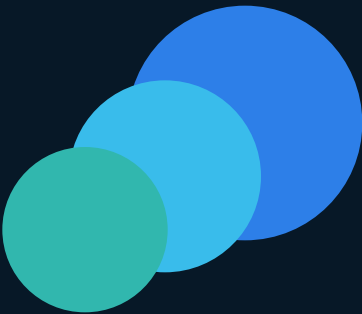




Vantrell Systems

AI Lead Operations

AI-assisted lead qualification, deterministic territory routing, CRM enrichment, controlled follow-up, human review, and operational audit logging for a fictional B2B SaaS environment.

Google Forms

Zapier

AI by Zapier

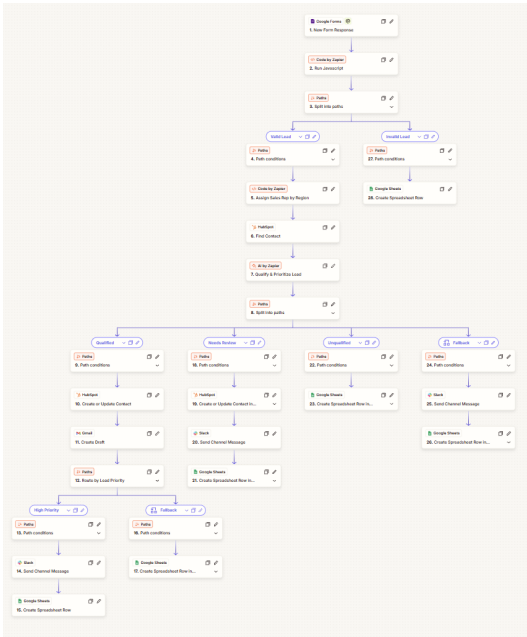
HubSpot

Gmail

Slack

Google Sheets

END-TO-END WORKFLOW



5

controlled functional tests

3

sales territories verified

HITL

human-in-the-loop

Jerry J. Hudson

AI Workflow Automation / Revenue Operations

Fictional SaaS environment

From lead intake to controlled sales action

The goal was not to let an LLM run lead operations autonomously. The workflow combines AI classification with deterministic validation, territory assignment, and branch logic so qualified leads move quickly while ambiguous cases stay under human control.

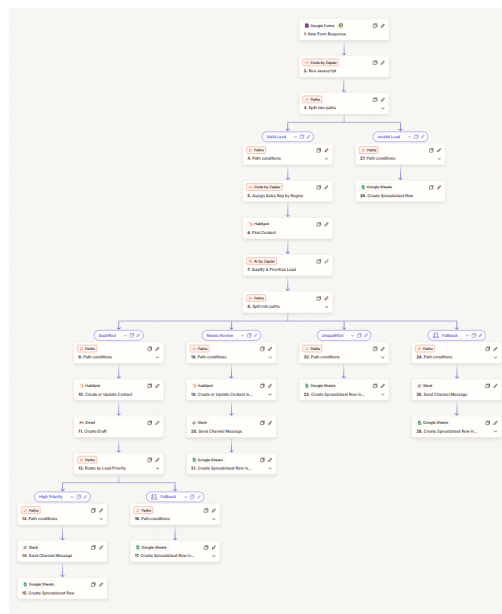
THE CHALLENGE

Inbound sales leads need consistent validation, ownership, prioritization, CRM updates, and timely follow-up - without sending bad data or uncertain AI decisions downstream.

THE SOLUTION

Zapier validates and sanitizes form data, assigns territory deterministically, checks HubSpot, uses AI for qualification, then routes each outcome to controlled CRM, Gmail, Slack, and logging actions.

WORKFLOW ARCHITECTURE



DESIGN PRINCIPLES

- Structured AI output: intent, priority, qualification status, confidence, summary, recommended action, and human-review flag.
- Deterministic code controls validation and territory ownership; the model does not assign sales regions.
- Qualified follow-up is created in Gmail as a draft - never auto-sent.
- Every terminal branch writes one centralized Run Log row for traceability.

AI where it helps. Rules where they matter.

The model supplies commercial context. Deterministic controls enforce data quality, ownership, and safe operational outcomes.

CONTROLLED DECISION LAYERS

- 1 Validate & sanitize**
 Required fields, email format, inquiry type, location, text cleanup, and sheet-safe logging.
- 2 Assign territory**
 Eastern -> Nina Patel, Central -> Jordan Lee, West -> Avery Morgan. Implemented in code, not AI.
- 3 Qualify with AI**
 Classifies intent, priority, qualification status, confidence, summary, and recommended action.
- 4 Route by policy**
 Qualified, Needs Review, Unqualified, and defensive Fallback branches control downstream actions.

OUTCOME POLICY

Qualified / High
 HubSpot + Gmail draft + Slack + log

Qualified / Standard
 HubSpot + Gmail draft + log

Needs Review
 HubSpot + Slack review alert + log

Unqualified
 Run Log only

Fallback
 Slack exception alert + log

Invalid
 Rejected before AI / CRM; Run Log only

Why this matters

AI classification can be probabilistic. Validation, ownership, branch eligibility, and outbound-action policy remain explicit and reviewable so a model judgment does not silently become an uncontrolled customer or CRM action.

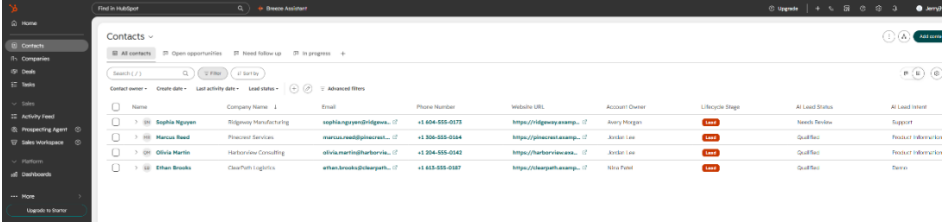
Operational pattern

Probabilistic classification; deterministic execution policy; human review where judgment matters.

CRM enrichment plus a centralized audit trail

HubSpot becomes the sales operations surface, while Google Sheets records one terminal outcome per execution for traceability and evaluation.

HUBSPOT - ENRICHED CONTACTS



Name	Company Name	Email	Phone Number	Website URL	Account Owner	Lifecycle Stage	AI Lead Status	AI Lead Intent	AI Lead Priority	AI Confidence	AI Last Processed (EST)	AI Qualification Summary	AI Re
Sophia Nguyen	Highway Manufacturing	sophia.nguyen@highway...	+1 855-855-0173	https://highwaymanu...	Amy Morgan	Lead	Needs Review	Support	Medium	95	Yesterday at 10:51 PM EST	Sophia Nguyen, Revenue Op...	Rea
Marcus Reed	Pincrest Services	marcus.reed@pincrest...	+1 304-855-0164	https://pincrestservi...	Jordan Lee	Lead	Qualified	Product Information	Medium	95	Yesterday at 10:49 PM EST	Marcus Reed, Business Op...	Rea
Olivia Martin	Harbortree Consulting	olivia.martin@harbortree...	+1 304-855-0163	https://harbortreecons...	Jordan Lee	Lead	Qualified	Product Information	High	95	Yesterday at 10:49 PM EST	Olivia Martin, Operations Pa...	Rea
Ethan Brooks	ClearPath Logistics	ethan.brooks@clearpath...	+1 855-855-0187	https://clearpathlogis...	Nina Patel	Lead	Qualified	Review	High	95	Yesterday at 10:36 PM EST	Ethan Brooks, Director of Log...	Rea

3

territories

Eastern / Central / West

3

AI routes

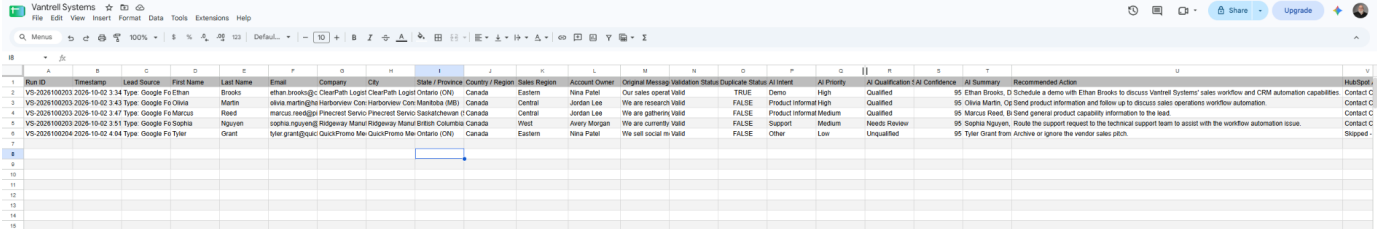
Qualified / Review / Unqualified

1

audit row

per terminal execution

CENTRALIZED RUN LOG



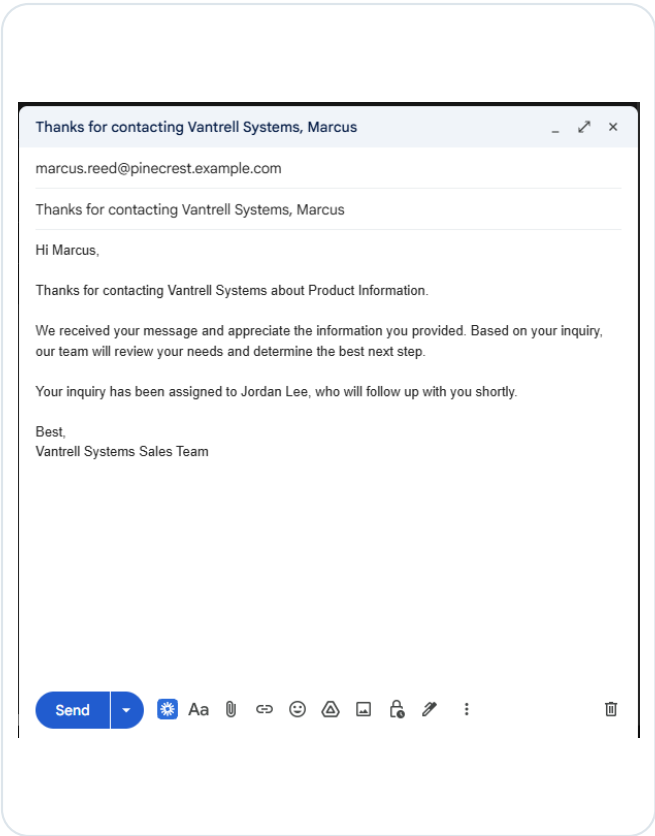
Run ID	Timestamp	Lead Source	First Name	Last Name	Email	Company	City	State / Province	Country / Region	Sales Region	Account Owner	Original Message	Validation Status	Duplicate Status	AI Intent	AI Priority	AI Qualification	AI Confidence	AI Summary	Recommended Action	HubSpot ID
VS-2026100203	2026-10-02 13:14	Type: Google Fe	Ethan	Brooks	ethan.brooks@clearpath...	ClearPath Logist	Logist	Ontario (ON)	Canada	Eastern	Nina Patel	Our sales operat	Valid	TRUE	Demo	High	Qualified	95	Ethan Brooks, O	Schedule a demo with Ethan Brooks to discuss Vantrell Systems' sales workflow and CRM automation capabilities.	Contact C
VS-2026100203	2026-10-02 14:13	Type: Google Fe	Olivia	Martin	olivia.martin@harbortree...	Harbortree Con	Consulting	Montreal (QC)	Canada	Central	Jordan Lee	We are interest	Valid	FALSE	Product Informa	High	Qualified	95	Olivia Martin, O	Send product information and follow up to discuss sales operations workflow automation.	Contact C
VS-2026100203	2026-10-02 14:47	Type: Google Fe	Marcus	Reed	marcus.reed@pincrest...	Pincrest Servis	Services	Saskatchewan (S)	Canada	Central	Jordan Lee	We are gatherin	Valid	FALSE	Product Informa	Medium	Qualified	95	Marcus Reed, B	Send general product capability information to the lead.	Contact C
VS-2026100203	2026-10-02 15:11	Type: Google Fe	Sophia	Nguyen	sophia.nguyen@highway...	Highway Manu	Manufacturing	Manitoba (MB)	Canada	West	Amy Morgan	We are currentl	Valid	FALSE	Support	Medium	Needs Review	95	Sophia Nguyen, R	Route the support request to the technical support team to assist with the workflow automation issue.	Contact C
VS-2026100204	2026-10-02 16:14	Type: Google Fe	Tyler	Grant	tyler.grant@quickphone...	QuickPhone Me	Mobile	Ontario (ON)	Canada	Eastern	Nina Patel	We sell social m	Valid	FALSE	Other	Low	Unqualified	95	Tyler Grant from	Archive or ignore the vendor sales pitch.	Shipped C

The log preserves source data, validation status, territory, owner, AI outputs, downstream actions, human-review state, final status, and errors in one operational record.

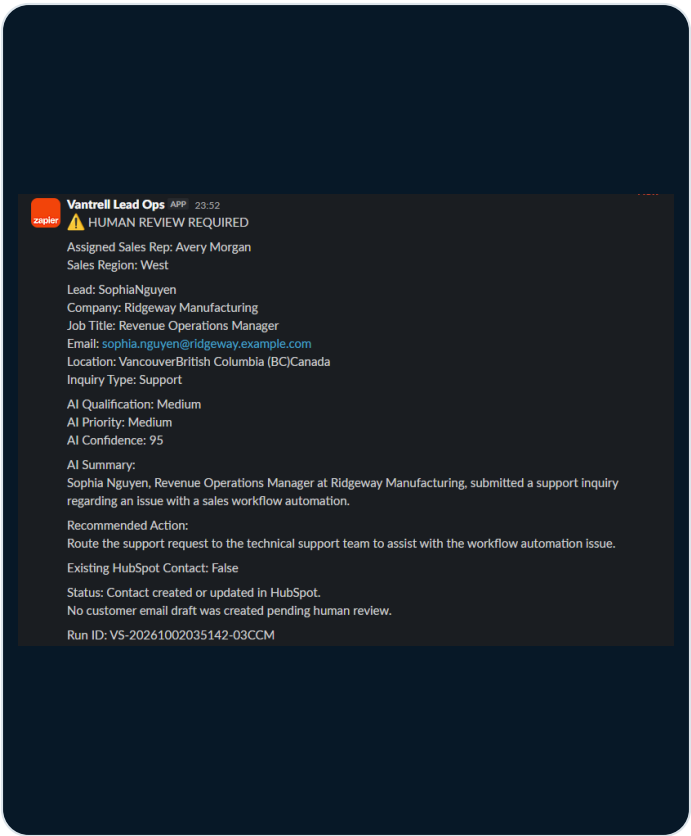
Helpful automation without auto-send risk

Qualified leads can receive a prepared Gmail draft, while support or ambiguous cases are escalated to Slack for human review. The workflow never auto-sends customer email.

EMAIL DRAFT - QUALIFIED STANDARD LEAD



SLACK - HUMAN REVIEW REQUIRED



Control point

The automation creates a draft, not a sent message. Needs Review cases create no customer draft and instead surface the context, AI summary, recommended action, and ownership in #ai-lead-ops.

SAFE OUTCOME STATES

Qualified / High Draft + sales alert	Qualified / Standard Draft; no Slack alert	Needs Review Escalated; no customer draft
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A controlled 5-case functional evaluation

This was a portfolio-scale functional test, not a production benchmark. Expected workflow behavior was compared with actual outcomes across validation, territory routing, AI qualification, CRM actions, email drafting, Slack alerts, and audit logging.

5/5

functional tests

passed

3/3

territories

verified

3

AI routes

verified

2

priority routes

verified

TEST CASE RESULTS

Test Case ID	Scenario	Test Lead	Expected Validation	Expected Region	Expected Owner	Expected AI Status	Expected Priority	Expected HubSpot Action	Expected Email Action	Expected Slack Action	Expected Final Status	Actual Result	Pass / Fail	Notes
TC-01	Qualified High Priority Lead	Ethan Brooks	Valid	Eastern	Nina Patel	Qualified	High	Contact Created or Updated	Gmail Draft Created	High Priority Alert Sent - #new-leads	Qualified - High Priority - Routed to Sales Rep	Workflow completed as expected	PASS	Verified HubSpot fields, Gmail draft, Slack alert, and Run Log entry.
TC-02	Qualified Standard Priority Lead	Marcus Reed	Valid	Central	Janita Lee	Qualified	Medium or Low	Contact Created or Updated	Gmail Draft Created	No Alert - Standard Priority	Qualified - Standard Priority - Routed to Sales Rep	Workflow completed as expected	PASS	Verified Standard Priority branch and no Slack sales alert.
TC-03	Support Inquiry Requiring Human Review	Stephan Nguyen	Valid	West	Amy Morgan	Needs Review	AI Determined	Contact Created or Updated	No Draft - Pending Human Review	Human Review Alert Sent - #ai-lead-ops	Needs Review - Human Review Required	Workflow completed as expected	PASS	Verified human-in-the-loop route to customer email draft created.
TC-04	Invalid Inquiry Type	Tyler Grant	Invalid	Not Assigned	Not Assigned	Not Processed	Not Processed	Skipped - Validation Failed	Skipped - Validation Failed	None	Rejected - Validation Failed	Validation rejected unexpected inquiry type as expected	PASS	Form originally returned "Other: See message", validation stopped.
TC-05	Irrelevant Vendor Solicitation	Tyler Grant	Valid	Eastern	Nina Patel	Unqualified	AI Determined	Skipped - Unqualified	Skipped - Unqualified	None	Unqualified - No Sales Follow-Up	Workflow completed as expected	PASS	Verified lead was logged without creating a HubSpot contact. One

WHAT THE TEST SHOWED

- Qualified High: CRM update, Gmail draft, #new-leads alert, and Run Log.
- Qualified Standard: CRM update and Gmail draft with no sales Slack alert.
- Needs Review: CRM update and #ai-lead-ops escalation with no customer draft.
- Unqualified: no CRM update, no Gmail draft, no Slack alert; Run Log only.
- Invalid input: stopped before territory assignment, AI, CRM, email, and Slack.

Evaluation note

The defensive fallback route was implemented for unexpected AI qualification outputs but was not artificially triggered. These results demonstrate functional behavior for the tested cases and should not be presented as production-scale model accuracy.

What this project demonstrates

The value is not simply that an LLM can label a lead. It is the system around the model: deterministic data controls, explicit routing policy, CRM integration, human review, safe drafting boundaries, exception handling, and measurable evaluation.

AI WORKFLOW DESIGN

Structured qualification, confidence, summaries, and recommended actions.

REVENUE OPERATIONS

Territory ownership, lead priority, CRM enrichment, and sales routing.

AUTOMATION ENGINEERING

Zapier paths, JavaScript validation/routing, HubSpot, Gmail, Slack, Sheets.

HUMAN-IN-THE-LOOP

Draft-only customer communication and explicit review escalation.

OBSERVABILITY

One terminal Run Log row per execution with branch-specific outcomes.

EVALUATION

Expected-vs-actual test cases, branch verification, and documented limitations.

FINAL RESULT

A complete AI-assisted lead operations workflow that can validate, assign, qualify, route, enrich, draft, escalate, and log inbound sales work - while keeping customer communication and ambiguous decisions under human control.

Jerry J. Hudson

Vantrell Systems AI Lead Operations - Portfolio Case Study

Zapier

AI by Zapier

HubSpot

Google Forms

Gmail

Slack

Google Sheets