ILHAM KURNIAWAN

2026 EDITION

PORTFOLIO

Systems that run themselves.

A catalog of work in cloud infrastructure, intelligent automation, and connected devices — by an engineer whose goal is to automate himself out of the loop.

THE ENGINEER

Site Reliability Engineer
PT Bank Amar Indonesia — Tolaram Group

THE PLACE

Tangerang, Indonesia
Working across GCP · AWS · Alibaba Cloud

THE TRAIL

hmdilham.dev
github.com/hmdilham · in/hmdilham

01 · PROFILE

Reliability by profession, autonomy by obsession.

Muhammad Ilham Kurniawan has spent fifteen years keeping technology alive — from factory networks to a digital bank that cannot afford a minute of downtime.

The career began in server rooms: pulling cable, hardening Linux boxes, and keeping a steel manufacturer's infrastructure alive. Today the same instinct operates at enterprise scale — as Site Reliability Engineer at PT Bank Amar Indonesia (Tolaram Group), he owns reliability strategy for digital-banking platforms: SLOs, incident management, data pipelines, and the automation that holds it all together.

That conviction extends past the day job. He builds AI agents that administer servers through natural language, smart buildings that track their own energy, and pipelines where Terraform, Ansible, and Kubernetes turn infrastructure into code. As a trainer in Cloud, DevOps, and IoT — and a Master's candidate in Informatics Engineering — he helps other engineers build the same way.

> *"The best infrastructure is the kind nobody has to think about — it observes itself, heals itself, and quietly does its job."*

IN THIS CATALOG

15+	3	6	10+
YEARS IN ENGINEERING	CLOUD PLATFORMS	CERTIFICATIONS	SYSTEMS SHIPPED

02 · FLAGSHIP PRODUCT

RAE

Remote Agent Executor

AI × OPERATIONS

What if an AI agent could safely run your servers? RAE is an Ansible-like remote-execution engine, written in pure Go, that speaks the Model Context Protocol — so Claude, Gemini, or any MCP client can inventory hosts, run playbooks, and learn from every execution.

WHY IT MATTERS

- MCP server exposing 10 operational tools to AI agents over SSH.
- Adaptive memory in SQLite — learns command patterns and suggests the next step.
- NLP intent recognition (TF-IDF + cosine) in Bahasa Indonesia and English.
- Anomaly detection flags unusual failure rates before they become incidents.
- Ansible-compatible YAML inventory; concurrent SSH pooling; dry-run mode.

GO · MCP · SQLITE · SSH · NLP · COBRA CLI

SPECIFICATIONS

Language	**Go 1.21+ (zero deps)**
Interface	**MCP · JSON-RPC / stdio**
Memory	**SQLite, auto-created**
NLP	**TF-IDF + cosine (ID/EN)**
Transport	**SSH connection pool**
Inventory	**Ansible-compatible YAML**
License	**MIT**

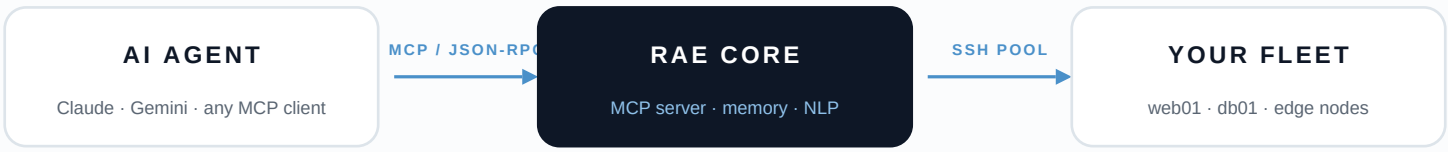
AN AGENT AT WORK

```
User → AI:  "update semua server"

AI → RAE:  list_hosts()
  ← web01 (ubuntu), db01 (ubuntu)
AI → RAE:  run_command(host="web01",
    cmd="apt upgrade -y", sudo=true)
  ← status: ok
AI → RAE:  get_suggestions(...)
  ← "Biasanya setelah update, Anda
     restart nginx. Lakukan sekarang?"

AI → User: "Semua server updated [ok]"
```

HOW IT FITS



The AI collection

Personal systems where large language models do real operational work — not demos.

NO. 02

Shopping Agent

Your personal procurement department.

A multi-agent system that researches, compares, and checks out products on online shops autonomously. Agents divide the work — searching, evaluating, and acting through a real browser — so a purchase becomes a delegated task, not an errand.

LANGGRAPH · PYTHON · PLAYWRIGHT · MULTI-AGENT

NO. 03

AI Intelligence System

A chief-of-staff that never sleeps.

A personal AI aide that runs unattended: daily intelligence briefings before the day starts, contextual reminders, and system-health reports. Built on LLMs and disciplined scheduling — information arrives before it is asked for.

LLM · HERMES · CRON · AUTOMATION

NO. 04

Smart Home Automation

A house that minds itself.

A fully self-hosted smart home: AI-assisted air-conditioning, security, and energy monitoring. Local-first and cloud-optional — comfort automated, privacy kept, and every watt accounted for.

HOME ASSISTANT · MQTT · TUYA · NODE-RED · ESP32

Agents that don’t just chat — they act.

All three systems run daily in production at home and beyond.

Built for the real world

Products serving researchers, schools, and small businesses across Indonesia.

NO. 05 — RESEARCH TOOL

JurnalSearch

An academic search engine querying CrossRef, Semantic Scholar, Google Scholar, and OpenAlex in parallel — enriched with Scopus Quartile, SINTA, and SJR rankings, streamed live, exportable to CSV/BibTeX.

PYTHON · FLASK · AIOHTTP · PANDAS

NO. 06 — EDTECH

School Information System

Education-management modules for schools: student attendance, discipline-point tracking, and e-report cards (e-raport) — integration-ready with Moodle e-learning.

PHP · MYSQL · MOODLE-READY

NO. 07 — CLOUD & OPS

Multi-Cloud Hosting Platform

A self-managed hosting platform for schools and SMBs — provisioning, SSL, DNS, and mail, spread across GCP, AWS, and Alibaba Cloud.

HESTIACP · NGINX · GCP · AWS · ALIYUN

NO. 08 — TRAINING

IoT & DevOps Curriculum

Open course materials and working source code for fundamental and advanced IoT classes (ESP32/C++), plus DevOps modules used in professional training programs.

ESP32 · C++ · CURRICULUM · DEVOPS

ALSO ON THE BENCH

AI text detection experiments (ai-humanizer) · shell & dotfile automation · local llama.cpp inference · ESP32 firmware tinkering — the rest lives at github.com/hmdilham.

NO. 09

Smart Plant

A plant pot that waters itself.

IOT × PRODUCT DESIGN

A commercial-grade smart plant pot built around the ESP32: it senses soil moisture, waters on its own, and serves its entire dashboard from the pot itself — no cloud account, no subscription. Solar keeps it alive outdoors; a capacitive touchscreen keeps it friendly up close.

WHY IT STANDS OUT

- Capacitive soil sensing with threshold-based auto-watering — plus a safe mode that parks the pump when the water tank runs dry.
- A 1.54″ capacitive touchscreen UI: swipe between soil, power, and device screens; tap to water, with confirmation.
- Web dashboard, REST API, and WebSocket telemetry served straight from the ESP32 — offline-first, zero cloud dependency.
- Solar-powered: 2W panel with MPPT charging into an 18650 cell; tiered low-battery modes stretch runtime to 7–14 days off-grid.
- Captive-portal WiFi setup, mDNS, and OTA updates — on a custom KiCad PCB inside a 3D-printed, splash-resistant enclosure.

ESP32 · C++ / PLATFORMIO · WEBSOCKET · SOLAR + LI-ION · KICAD · OTA

SPECIFICATIONS

MCU	**ESP32 dual-core + WiFi**
Display	**1.54″ ST7789 · cap. touch**
Sensors	**Soil · DHT22 · water level**
Power	**Solar 2W · 18650 3000mAh**
Runtime	**7–14 days without sun**
Dashboard	**ESP32-hosted · WebSocket**
Updates	**OTA via WiFi (ElegantOTA)**

THE PRODUCT LINE

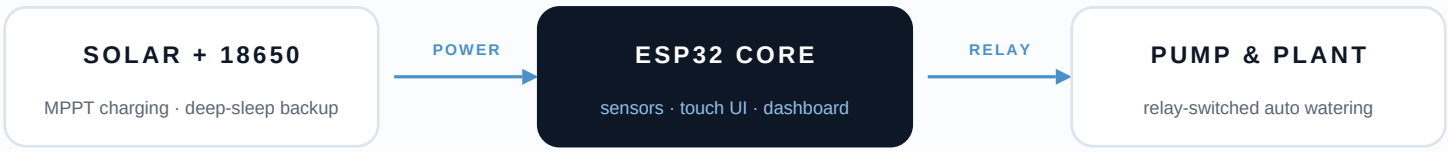
PROTOTYPE — ~Rp 220K
ESP8266 · OLED 0.96″ · USB power

FREE — ~Rp 380K
ESP8266 · OLED 0.96″ · USB + battery

PRO — Rp 950K+
ESP32 · touchscreen · solar + battery

Pro tier: BOM ~Rp 428K — margin 55–65%

FROM SUNLIGHT TO SOIL



06 · SERVICES

Ways we can work together

Fifteen years of practice, offered as a service — from a single architecture review to a fully managed platform.

01

Site Reliability Engineering

SLO/SLI design, incident management, and reliability strategy for platforms that cannot afford downtime.

02

Cloud & DevOps

Multi-cloud architecture and migration (GCP, AWS, Alibaba), Kubernetes, CI/CD with Jenkins · GitLab · CircleCI · GitHub Actions · Spinnaker, Bitbucket, secrets with Infisical, IaC with Terraform & Ansible.

03

Monitoring & Observability

The Grafana stack — Prometheus, Loki, Alertmanager — turned into dashboards, alerts, and answers your team can act on.

04

IoT & Smart Building

Sensor networks, energy monitoring, and building automation: ESP32, MQTT, Home Assistant, Node-RED — from prototype to production.

05

AI & LLM Engineering

Agentic workflows (LangGraph, MCP), RAG pipelines over your documents, local LLM deployment with Ollama — private by design.

06

Training & Advisory

Cloud, DevOps, and IoT training from fundamentals to advanced; architecture advisory and knowledge transfer for internal teams.

ENGAGEMENT MODELS

Project-based delivery · Managed services with monthly SLA · Consulting & architecture review · In-house training

Fifteen years of keeping things running

SEP 2020 — PRESENT

DevOps Engineer → Site Reliability Engineer

PT Bank Amar Indonesia Tbk (Tolaram Group) · Jakarta

Joined as DevOps Engineer running multi-cloud infrastructure (GCP, AWS, Alibaba Cloud) and end-to-end release automation with Jenkins, GitLab CI/CD, CircleCI, GitHub Actions, and Spinnaker plus Bitbucket-based source control; promoted to SRE in 2023 to own reliability strategy for the group's digital-banking platforms — monitoring, incident management, data pipelines, and centralized secrets management with Infisical.

MAR 2017 — AUG 2020

DevOps Engineer / IT System Administrator

PT Indodev Niaga Internet (DataOn) · South Tangerang

Owned enterprise SaaS infrastructure on AWS plus main and DR data centers; migrated legacy Xen virtualization to Docker and OpenShift OKD.

OCT 2014 — FEB 2017

System Engineer

Surya Institute / STKIP Surya · South Tangerang

Administered Moodle LMS end-to-end and built school information systems — attendance, discipline points, e-report cards.

FEB 2010 — SEP 2014

IT System & Network Administrator — Coordinator

PT Patama Adijaya Steel · Tangerang

Planned and ran company-wide IT — servers, networks, CCTV — while coordinating the IT team and supporting ISO 9001:2008.

CERTIFICATIONS

- **Google Cloud** — Developer
- **Alibaba Cloud ACA** — Cloud Computing
- **Alibaba Cloud ACA** — Cloud Security
- **Red Hat** — Administrator
- **Mikrotik MTCNA** — Network Associate
- **Mikrotik MTCRE** — Routing Engineer

EDUCATION

Universitas Pamulang
Master's (S2), Informatics Engineering
2024 – present · thesis phase

University of Raharja
B.Sc. (S1), Computer Systems
2006 – 2010

CONTACT

Let's build something that runs itself.

Open to collaboration on Cloud × IoT × AI projects — consulting, architecture reviews, training, or a conversation about making systems more autonomous.

EMAIL	hmdilham@gmail.com
WHATSAPP	0896 7136 6036
WEB	hmdilham.dev
GITHUB	github.com/hmdilham
LINKEDIN	linkedin.com/in/hmdilham

SCAN — HMDILHAM.DEV

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