



PYCENTRIC

CRAFTING SOFTWARE SOLUTIONS WITH
PRECISION

REG NO: K2024121493 (PTY) LTD

● ENGINEERING FEASIBILITY & ARCHITECTURE STUDY

48-Hour Architecture & Spatial Feasibility Blueprint

Sample Client Deliverable: Multi-System CRM/ERP Automation, WhatsApp Order Intake & Single-Pod Gateway Architecture

INSTITUTIONAL ENGINEERING PEDIGREE

Founded and directed by senior engineering leaders with enterprise track records delivering mission-critical cloud and fintech systems at Amazon Web Services (AWS), BMW IT Hub, and First National Bank (FNB Fintech).

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Classification: CLIENT SAMPLE DELIVERABLE (REDACTED)

PART 1 : EXECUTIVE DECISION GATE & OPERATIONAL AUDIT

Executive Summary & Decision Gate

Recommendation: CONDITIONAL GO (Phase 1 Automation Core First)

Deploy the Single-Pod Event-Driven Integration Core (Python 3.12 + FastAPI + n8n orchestration) in Phase 1 (2 weeks) to eliminate manual order re-entry immediately; defer native mobile driver wrappers to Phase 2 after order volume exceeds 500/day.

Following our 30-minute technical discovery session with **Sample Logistics & Distribution (Pty) Ltd**, PyCentric Principal Engineering audited the existing order-to-invoice workflow across WhatsApp Business, WooCommerce, and Xero Accounting. Operations staff currently spend **18.5 hours per week** manually copying customer orders, checking stock in spreadsheets, and issuing PDF pro-forma invoices.

< 45 sec	17.0 hrs/wk	2.8 Months	100% IP
AUTOMATED QUOTE LEAD TIME (DOWN FROM 4.2 HRS)	MANUAL ADMIN SAVED ACROSS 3 OPERATIONS STAFF	FULL CAPITAL PAYBACK PERIOD (BASE SCENARIO)	FULL GIT REPOSITORY & WORKFLOW OWNERSHIP

Baseline vs. Target Operational Performance

METRIC / DECISION DIMENSION	CURRENT MANUAL BASELINE	TARGET AUTOMATED STATE (PYCENTRIC)	VERIFIED IMPACT
Order-to-Invoice Lead Time	4.2 hours average	< 45 seconds (automated webhook)	99.7% faster response
Manual Admin Hours / Week	18.5 hrs/wk across 3 staff	< 1.5 hrs/wk exception review	17.0 hrs/wk saved
Stock / Invoice Mismatch Rate	14.2% of weekly orders	< 0.5% (idempotent ledger lock)	96.5% error reduction
Monthly Cloud Hosting Footprint	R 4,800/mo fragmented SaaS	R 850/mo Single-Pod container	82.3% infra savings

PART 2 : TARGET SYSTEM ARCHITECTURE & FINANCIAL MODEL

Single-Pod Gateway Architecture & TCO Model

To guarantee high reliability without enterprise cloud bloat, PyCentric designs every integration around our **Constitutional Single-Pod Footprint** (< 1.5 vCPU , < 1.5 GB RAM steady-state) hosted in `af-south-1` (Cape Town).

Layer 1-2: Edge Gateway & FastAPI Core

- **Traefik TLS 1.3 Ingress**: Enforces rate limiting, HMAC-SHA256 webhook signature verification, and mTLS headers.
- **FastAPI Core Engine (Python 3.12)**: Validates payloads via Pydantic v2 and enforces idempotency keys before execution.

Layer 3-4: PostGIS Ledger & n8n Workers

- **PostgreSQL 16 + PostGIS**: Stores immutable audit trails, idempotency locks, and spatial delivery zone catchments.
- **n8n Orchestration Worker**: Executes Xero invoice creation, stock reservation, and WhatsApp customer notifications.

Build-vs-Buy Evaluation (24-Month Total Cost of Ownership)

EVALUATION CRITERION	OPTION A: MANUAL + ZAPIER PRO	OPTION B: HEAVY ENTERPRISE ERP	OPTION C: PYCENTRIC CUSTOM CORE
Upfront Engineering Cost	R 0 (Self-configured)	R 420,000+ implementation	R 45,000 Fixed-Price
24-Month SaaS / Task Fees	R 118,000 (Zapier task overages)	R 288,000 licensing	R 20,400 hosting
Multi-Step Stock Locking	Not supported natively	Supported (6-month rollout)	Supported (2-week rollout)
Code & IP Ownership	0% (Proprietary SaaS)	0% (Vendor locked)	100% Client IP Ownership
24-Month Total Cost (TCO)	R 118,000	R 708,000	R 65,400 (Lowest TCO)

3-Scenario Sensitivity Matrix (12-Month Net Benefit)

Downside Case (60% adoption, 10 hrs/wk saved): R 114,000/yr net savings (4.7-month payback). Base Case (85% adoption, 17 hrs/wk saved): R 198,500/yr net savings (2.8-month payback, 341% Year-1 ROI). Upside Case (100% adoption + spatial route batching): R 268,000/yr net savings (2.0-month payback).