

FULL-STACK, NOT FULL-BOM

Own the intelligence. Standardize the interface. Buy the hardware.



QAVEN is a full-stack warehouse autonomy company – vertically integrated around intelligence, not around a robot chassis.

MODEL A – OEM FULL STACK

Integrated around **their** robots

- WMS / ERP Integration
- WES / RMS / Fleet Software
- Navigation & Traffic Mgmt
- Perception & Localisation
- Embedded Control
- Sensors & Safety
- Electronics & Power
- Motors & Mechanics
- Chassis



MODEL B – THIN INTEGRATOR LAYER

The **risky** middle

- WMS Adapters
- Business Rules & Logic
- Fleet Dashboard
- OEM APIs



MODEL C – QAVEN FULL-STACK WAREHOUSE INTELLIGENCE

Integrated around the warehouse **outcome**

- Business Intent
- SEMANTIQ – Agentic Execution
- Warehouse World Model
- SEMANTIQ – Architecture Evolution
- Simulation & Counterfactual Twins
- Operational Policies & Optimization
- QAVEN Core (Execution Kernel)
- Canonical Robot Capability Layer
- Vendor Abstraction / Adapters



OWN
Differentiating
Intelligence
Stack

STANDARDIZE
Interface
Boundary

BUY
Physical
Execution
Layer

- Strength:** Deep hardware-software integration
- Weakness:** Optimizes the warehouse for the vendor's portfolio

- Strength:** Low capex, fast to start
- Weakness:** Easy to displace from above and below. Becomes a system integrator.

THE INTERFACE IS BECOMING SPECIFIABLE



VDA 5050 v3.0 (2026)

- Reduces integration complexity
- Enables heterogeneous fleets
- Supports diverse navigation and autonomy levels

Deliberately does **NOT** define:

- Traffic management strategies
- Routing & prioritization
- Congestion & deadlock resolution
- Interfaces to external IT systems



The lower interface is stabilizing.
The upper interfaces are becoming the new frontier of value.

DOUBLE HELIX – REINTERPRETED

The helix is turning... but one level above the robot.

Previous Integration Point

- Robot Hardware
- Navigation
- Fleet Software

New Discontinuity

- AI Reasoning
- World Models
- Semantic Control
- Simulation
- Physical-AI Telemetry

New Integration Point

- Warehouse Intent
- Intelligence
- Orchestration
- Execution Abstraction

From integrating the machine → to integrating the intelligence.

QAVEN BUILD-VS-BUY GATE

Build hardware only if most answers are YES.

- Is the capability strategically important to a large part of the market?
- Are at least two external suppliers unable or unwilling to provide it?
- Is the hardware/software interface stable to enable topology?
- Would owning it materially improve QAVEN's differentiation?
- Does it generate reusable IP, not a one-customer project?
- Can QAVEN capture enough economics to justify full investment?
- Is ODM / reference design ownership insufficient?



If mostly **NO** → Buy / Partner / Standardize
If mostly **YES** → Build / Co-develop / Own

HARDWARE SOVEREIGNTY LAYER

Depend on capabilities, not companies.

- Canonical Robot Capability Model**
Describe abilities in QAVEN's ontology
- QAVEN Robot Contract**
What QAVEN requires from execution resources
- Adapter SDK**
Plug vendors into QAVEN, not into core
- Certification Suite**
Automated tests for safety, reliability & compliance
- Digital Robot Twin**
Simulate before deploy
- Telemetry Sovereignty**
Define minimum data for control and learning
- Dual Sourcing**
Qualify multiple vendors per archetype

Hardware sovereignty without hardware manufacturing.

QAVEN STRATEGIC DOCTRINE

- 1 Own unstable interfaces.
- 2 Standardize stable interfaces.
- 3 Design replaceability.
- 4 Own the system model & learning loop.
- 5 Integrate around customer outcome.

- Keep rapidly evolving capabilities inside QAVEN.
- Use external ecosystems when contracts are reliable.
- Reduce switching cost, never increase it.
- Data, world model, simulation and intelligence stay in QAVEN.
- Vertical integration is a tool, not an identity.

WHY THIS CREATES A GENERATIONAL COMPANY

- Persistent Intelligence**
The World Model, history, simulation and semantic intelligence remain in QAVEN, regardless of robots or WMS.
- Architecture Evolution**
We don't just mix warehouses – we continuously redesign them.
- Neutral Optimization**
We optimize robot choices and the warehouse, not the other way around.



We are full-stack – just not full-BOM.

Own the intelligence stack

Own the control loop end-to-end

Own the world model

Own the customer outcome

Do not own every wheel

QAVEN Strategic Demo (live v0.1) | 25 August 2023