VANTIQ

WHITE PAPER

The Next Frontier of AI: Intelligence Everywhere

How an operational nervous system lets organizations coordinate and continuously evolve real-world operations with AI, live data and people

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Executive Summary

AI has already transformed how we work with information. Its next and larger wave is operating the real world: factories, hospitals, cities, supply chains, borders and disaster zones. There, decisions must happen in seconds, across many systems, machines, AI models and people, and a wrong or late decision has physical consequences.

The bottom line for executives

- **The bottleneck is infrastructure, not models.** Better AI models alone will not run a factory or a disaster response, just as a better generator did not create the power grid. What is missing is the infrastructure that connects and coordinates everything in real time.
- **Vantiq creates that infrastructure: an operational nervous system.** One platform that senses events, decides with AI, rules and people, acts across existing systems, and confirms the result, from the cloud to the edge.
- **It is proven in mission-critical operations.** Vantiq runs disaster response in Japan with NTT DATA, traffic safety in Texas with Texas A&M, and public safety for 11,000 cameras in Riyadh with NEC.
- **The prize is the ability to evolve.** Organizations that can change operations quickly create new products, services and partnerships. Those that cannot are disrupted.

What Vantiq delivers

Business need	What Vantiq provides	Executive outcome
Too many disconnected systems	Each system connects once; Vantiq coordinates them all in real time, with AI built in	Dramatically lower complexity, no rip-and-replace
Real-time response in the field	One application running across cloud, edge and devices	Immediate action, even when connectivity is limited
Safe use of AI in operations	Defined AI roles, critics and human approval for consequential actions	Trustworthy automation with clear accountability
Speed of change	People and AI co-create applications that evolve while they run	Fast time to production; continuous improvement
Growth beyond today's business	A platform for new products, structures and 1 + 1 = 3 partnerships	New revenue and resilience against disruption

Why act now

Customers often call Vantiq in after an assembled approach has stalled. Hyperscaler services, IoT platforms, agent frameworks and event streaming each cover part of the job; stitching them together

leaves the customer owning the integration, security and maintenance of every connection. Starting on a single platform avoids that cost and gets a first operation into production quickly.

Recommended next steps

1. **Pick one high-value operation** where coordination is hardest today, with a clear owner and a measurable result.
2. **Map its systems, people and decisions** in a short discovery session with Vantiq and, where relevant, a partner.
3. **Prove it, then expand at your pace** to more sites, workflows and connected assets on the same platform.

1. The Challenge: Creating the Infrastructure AI Requires

Every great technology wave eventually becomes an infrastructure problem. Electric power is the clearest example. Electricity began with a local generator: one machine powering one building. It grew into electric networks, with generators driving many machines and buildings. Today it is a complex power grid of generation, transmission and distribution, monitored from control centers and balanced every second.

Each step created enormous value, and each step created complexity. The grid works only because infrastructure continuously monitors, balances and coordinates it. A better generator did not create the grid; coordination did.



Figure 1. AI is following the same path as electricity, from local use to infrastructure everywhere

AI is following the same path. It began with one user sending a prompt to a large language model and receiving an answer. It has moved to AI agents that reason with a model and call tools such as APIs and databases to get work done. The next stage is AI infrastructure: many agents and models running across the cloud, edge servers, computers, phones, vehicles and drones, coordinated in real time.

In the physical world the load changes every second. A machine fails, traffic backs up, water rises. Coordination must be continuous, it must reach the edge, and it must involve the people who are accountable for the outcome. That is the infrastructure challenge, and it is where Vantiq leads.

2. Vantiq: An Operational Nervous System

Vantiq uniquely creates this infrastructure: an operational nervous system for real-world operations. A single Vantiq application spans the cloud, edge nodes and every device involved, rather than being a collection of separate systems wired together.



Figure 2. One Vantiq application running across cloud, edge nodes, computers, phones, vehicles and drones

Like a nervous system, it works as a continuous loop:

- **Sense.** Events arrive from equipment, sensors, cameras and software, with context: which asset, its load, its recent history and what is happening nearby.
- **Decide.** The right capability makes each decision. Rules handle routine cases, AI weighs alternatives, and people make the consequential calls.
- **Act.** Vantiq drives the approved action through the systems and people involved.
- **Follow through.** It checks that the action worked and feeds the result into the next decision.

And like a nervous system, it reacts locally when it must. Logic runs at the edge, close to the equipment, while remaining part of one application with the cloud, so responses are immediate even when the connection to the cloud is slow or lost.

> **Why this is different**
>
> Others provide pieces: models, cloud services, IoT connectivity or event streams. Vantiq delivers the whole loop as one distributed application. This is not data collection or dashboards. Many organizations already collect data; very few can turn an event into a coordinated, verified response across several systems and teams in seconds.

3. Dramatically Reducing Complexity

A modern Industry 4.0 operation shows the problem clearly. It runs IoT detection, SCADA, product lifecycle management (PLM), quality management (QMS), manufacturing execution (MES), warehouse management (WMS), ERP, distribution and supply chains, plus the operators on the floor. Each system is good at its own job. None was designed to coordinate with the others in real time.

Without a coordinating layer, every connection is a separate integration project, and the real coordination happens through people: phone calls, emails and spreadsheets. With Vantiq at the center, each system connects once and Vantiq coordinates them all, with AI built in.

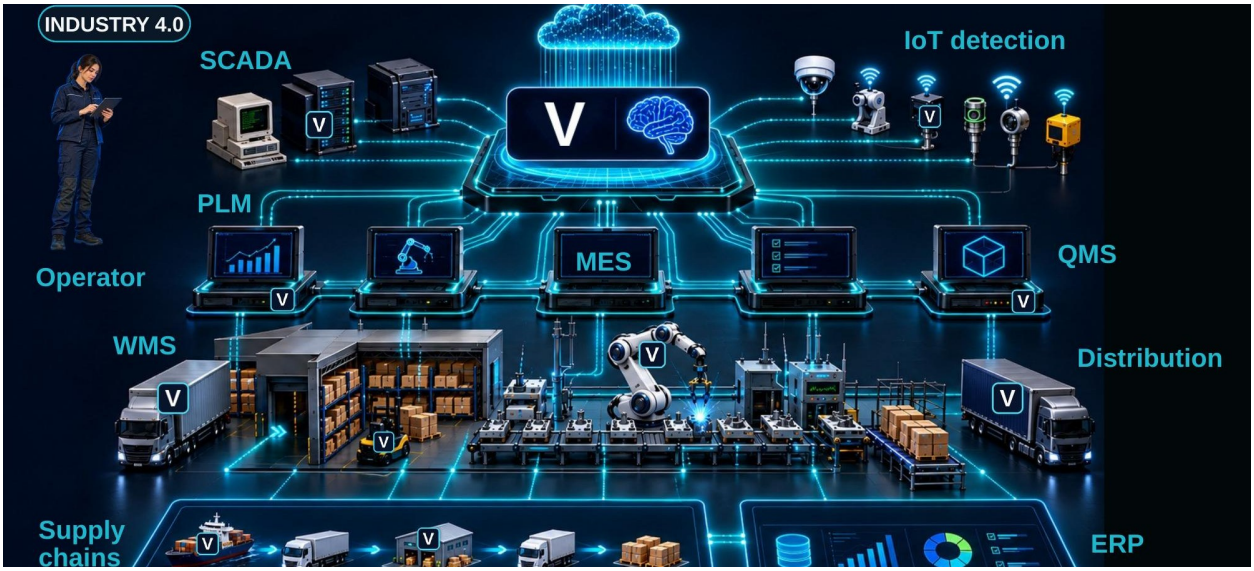

Figure 3. Vantiq connects the systems a factory already owns, and runs where the work happens (V badges)

Vantiq is not only in the cloud. As the V badges show, it runs on SCADA servers, PLM and QMS workstations, the robot arm, IoT devices, forklifts, trucks, ships and warehouses. Each runs its part of the same application, close to the work.

Consider one event. A machine stops in the middle of an order. Vantiq immediately knows which work is affected from the MES, whether material is available from the WMS, and what the change means for distribution and the ERP. It tells the operator what is happening and what decision is needed.

The executive point: the systems you have already paid for finally work together. There is no rip-and-replace project, and because each system connects once and then serves every application, the advantage over point-to-point integration grows with every system connected.

4. Orchestrating Complex Workflows

Connecting systems is the foundation. The payoff comes from orchestration: coordinating detection, AI, enterprise systems and people so they perform as one, the way a conductor leads an orchestra. Every musician is skilled, but without a conductor there is no music.

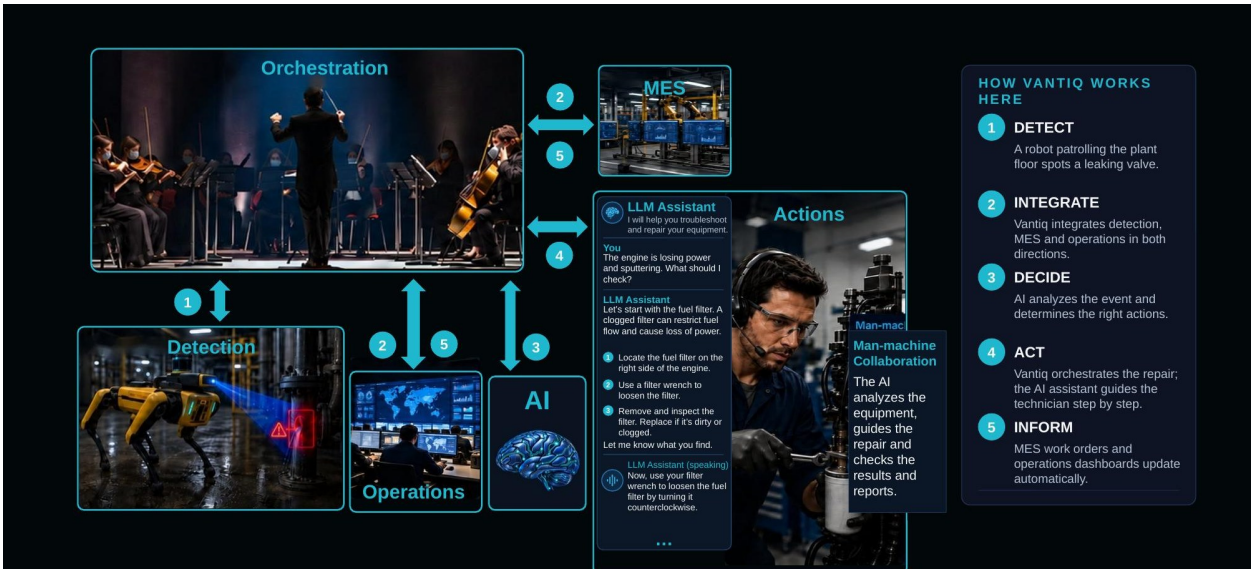

Figure 4. A complete workflow, from detection to repair to updated records

A plant-floor example shows the five steps:

1. **Detect.** A robot patrolling the plant floor spots a problem. Detection can come from robots, cameras, sensors or people.
2. **Integrate.** Vantiq connects the detection to the MES and operations in both directions, so the event arrives with context.
3. **Decide.** AI analyzes the event and determines the right actions, within the rules and permissions the business has set.
4. **Act.** An AI assistant guides the technician through the repair step by step, by voice and on screen, then checks the result.
5. **Inform.** Work orders and operations dashboards update automatically, and the system confirms the repair worked.

The technician stays in control throughout. The AI assists and documents; the person does the work and makes the judgment calls.

5. Trustworthy by Design

Applications that act in the physical world must be trustworthy. For many operations leaders, this is the first question about AI. Vantiq builds the answer into the platform: AI agents and people work together, each with a defined role.



Figure 5. AI agents and people at the same table, each with a defined role

- **RT Designer:** helps design and change the real-time application.
- **RT Operator:** runs the live operation and handles routine events.
- **RT Advisor:** recommends actions and explains the situation to the people responsible.
- **Critic:** challenges every proposed action before it is taken, looking for errors or missing context.
- **Human in the loop:** reviews, decides and stays accountable when the stakes are high.

Trust does not depend on any single model being right. It comes from a system of checks around every decision: grounding AI in current operating data and approved knowledge, a critic agent, voting across several models where useful, and a check on how critical the action is. Routine actions run automatically within agreed limits; exceptions and high-consequence decisions go to people with the evidence they need. And because Vantiq systems evolve while they run, they keep improving without being taken offline.

6. People and AI, Creating Together

Vantiq applications are created collaboratively by people and AI. The person brings domain knowledge, judgment and responsibility for the outcome. The AI brings speed: it generates application components, proposes logic, connects to systems and tests scenarios far faster than a team writing everything by hand.



Figure 6. Human-machine collaboration of a new kind

In practice, a domain expert describes what the operation needs: what to watch, what matters, what should happen and who must approve it. AI turns that description into a working application on the Vantiq platform. People review, refine and approve. The result reaches production fast and reflects how the business actually runs.

> **Man-machine collaboration of a new kind**
>
> The person sets the direction: what a function must do and the boundaries it must work within. The AI then makes it happen inside those boundaries, adjusting to each requirement and to the technical details of the situation.
>
> This relationship is unique, and Vantiq is built to take advantage of it. In our view, it will not be replaced by artificial general intelligence: AI cannot grasp the whole picture of a situation, or the motivation and desires behind it. People can.

Collaborative creation also lowers the skill barrier. Customers do not need a large team of specialized developers for every application, and because applications evolve while they run, the same people-plus-AI process keeps improving them after launch.

7. Organizations Must Innovate to Thrive

Vantiq does more than improve today's operations. It enables organizations to evolve. Those that do not innovate fall into the innovator's dilemma, described by Clayton Christensen: established companies are disrupted not because they miss new technology, but because the first new opportunities look smaller than today's business. The answer is to move early, at low cost, on a platform that scales when the idea works.



Figure 7. Leaders looking across the whole operation and asking what becomes possible

Once a company has an operational nervous system that operates everything, it can add functionality or change what is being done whenever it needs to. That opens four kinds of change:

- **New capabilities:** operations that sense, decide and respond in real time, using AI, IoT and edge computing.
- **New products:** new products and services, or existing ones modified quickly.
- **New structures:** people and AI working together, with new roles such as system designers, AI orchestrators and system operators. Over time, companies will structure themselves differently.
- **New partnerships:** when advanced, complex systems interface directly with each other, two companies can create what neither could alone. One plus one equals three.

That flexibility changes how a business operates and evolves, and it opens new opportunities fast. The innovation this unleashes will be immense.

8. Proven in Mission-Critical Operations

Vantiq is deployed with respected global partners in settings where minutes, and sometimes seconds, matter. In each case the customer had many disparate systems and data sources, and Vantiq was chosen because it could integrate them and orchestrate a response quickly.

Disaster management in Japan, with NTT DATA

Japan frequently faces earthquakes, typhoons, floods and landslides, creating an urgent need for government agencies to optimize real-time disaster response. Built on Vantiq's real-time orchestration platform with generative AI, NTT DATA's D-Resilio automatically communicates critical information to everyone involved.

- Analyzes threats using external sensors, satellite imagery, vision AI and social media.
- Integrates municipality-specific evacuation protocols and operations.
- Adapts to changing conditions with generative AI and real-time data.

Why Vantiq: only Vantiq could quickly address the challenge of integrating disparate, asynchronous systems to enhance disaster response.

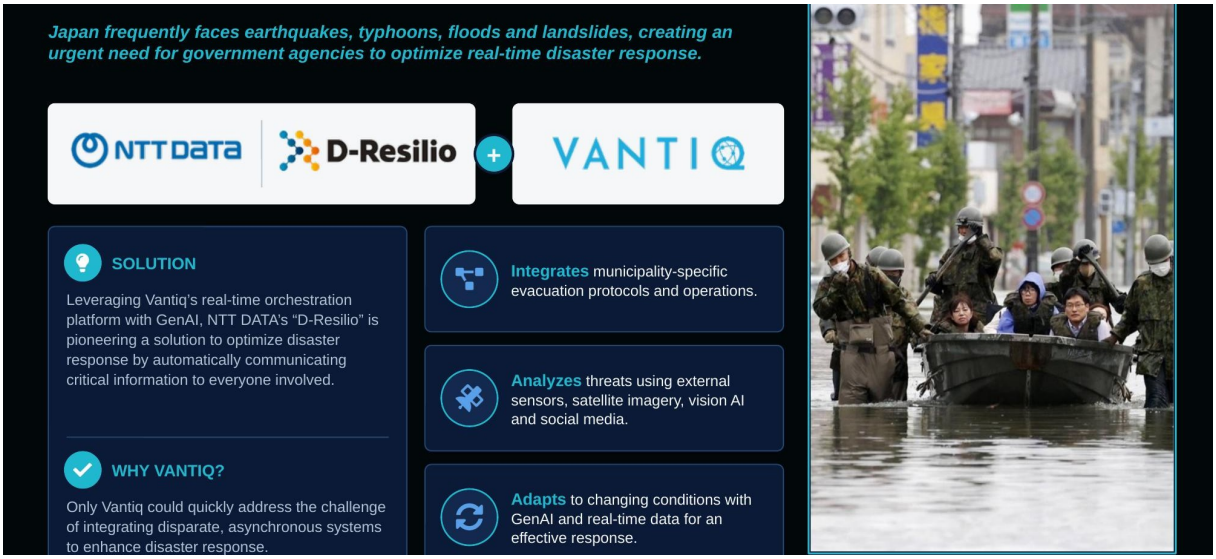

Figure 8. NTT DATA D-Resilio, built on Vantiq

Traffic efficiency and safety in Texas, with Texas A&M

With too many fatalities on its highways, Texas needed to optimize traffic flow and improve safety by adjusting traffic light timing and diverting traffic. Vantiq's platform uses generative AI to control traffic lights in real time, integrating numerous traffic systems.

- Uses sensors and connected vehicles (V2X) to change traffic lights and routing.
- Detects accidents and triggers automated emergency responses.

- Built to work with connected autonomous vehicles.

Why Vantiq: the Texas A&M Transportation Institute chose Vantiq for its ability to integrate systems, orchestrate real-time responses and rapidly deliver a mission-critical solution.

Public safety in Saudi Arabia, with NEC

NEC, building advanced safety and security systems for the King Abdullah Financial District (KAFD) in Riyadh, needed a real-time system to monitor more than 11,000 cameras across 1.6 million square meters and 95 buildings. Vantiq provides a scalable, real-time platform integrated with NEC NeoFace for facial recognition and video analysis.

- Initial deployments include crowd and traffic management, object monitoring, and Tag & Track, which monitors missing persons, suspects and other security risks in real time.

Why Vantiq: only Vantiq offered the flexibility to support NEC's needs, delivering a custom, adaptable solution beyond standard off-the-shelf products.

9. Applications Under Construction

The platform is horizontal. The same building blocks open new markets without rebuilding the technology each time: sense what is happening, add context, bring in AI and the right people, coordinate the action and confirm the result. The following applications are in development with partners.

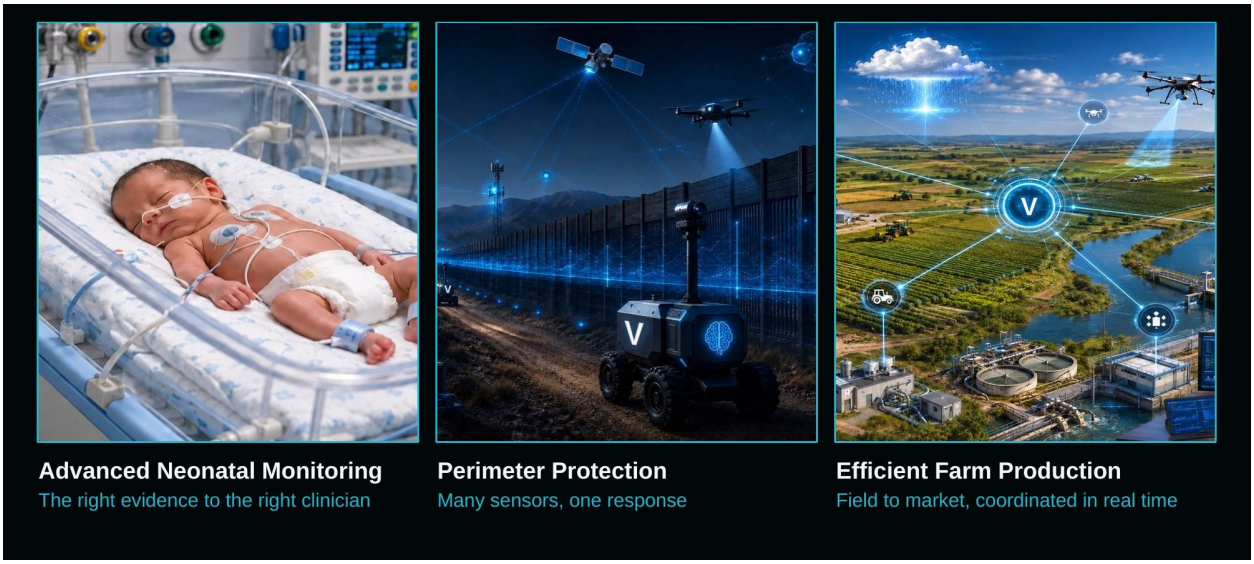

Figure 9. Applications under construction (illustrations)

- **Advanced neonatal monitoring.** Brings bedside monitors, cameras and the infant's clinical context into one real-time picture, gets the relevant evidence to the right clinician, coordinates escalation and confirms whether the intervention worked. Clinicians make every clinical decision.
- **Perimeter protection.** Fuses towers, cameras, drones, satellites and a patrol vehicle into one picture, routes exceptions to the right person, dispatches the patrol vehicle or drone and tracks the response, even at the edge when communications are limited.
- **Efficient farm production.** Connects drones, field sensors, weather, irrigation, tractors and the control center, and coordinates harvest timing with storage, processing and transport, from field to market.

Reestablishing infrastructure in an emergency

In a disaster, responders need a current view of conditions, resources and the people who need help, even when communications and power are down. A mobile unit brings communications, computing and power to the scene, and its tethered drone extends observation and connectivity across the affected area, linking cell and satellite networks. Vantiq dispatches teams, shares changing conditions and tracks each request to confirmed completion.

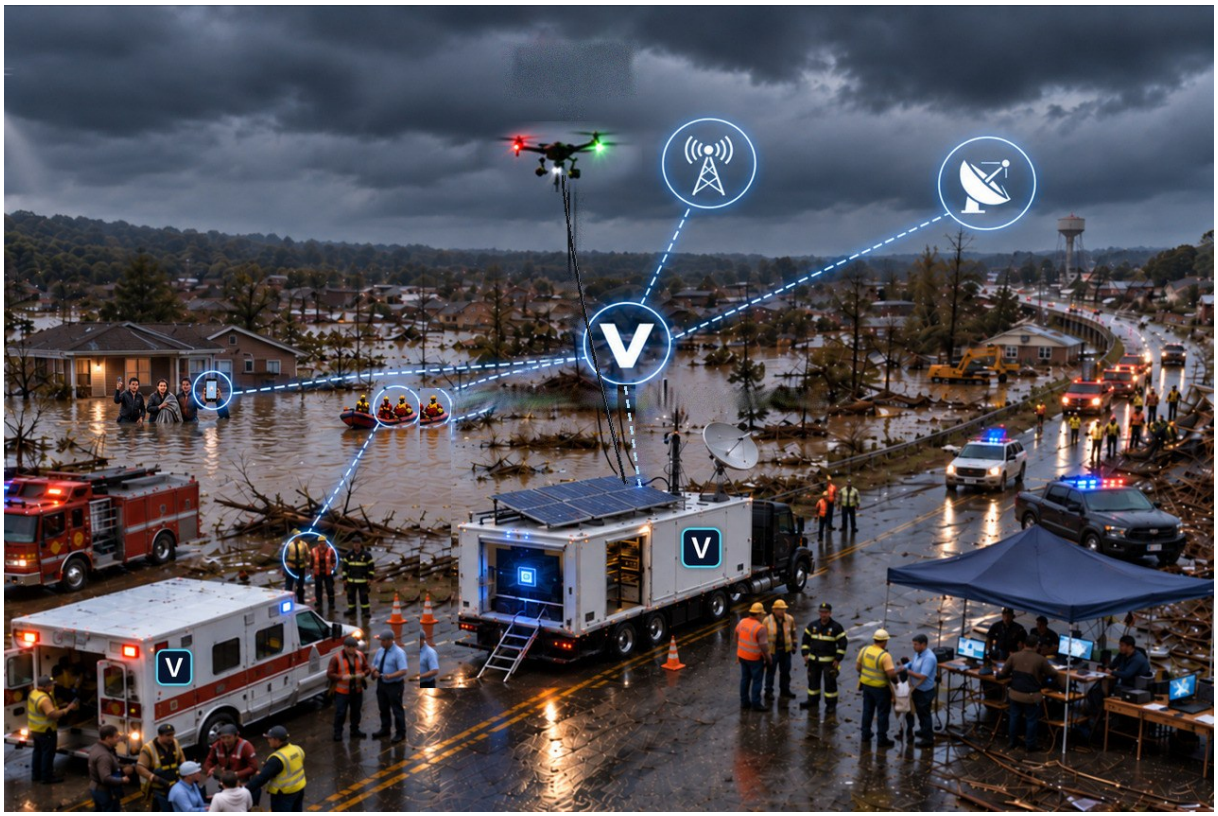

Figure 10. A mobile unit and tethered drone reestablishing infrastructure in a flood (illustration)

Note: *These applications are under construction. The images illustrate applications in development, not deployed reference customers or validated products.*

10. Why Vantiq: Often Called In After Failure

Customers frequently try first to build these systems by assembling hyperscaler services, IoT platforms, agent frameworks and event streaming. Each covers part of the job. After months of integration work the project stalls, and that is often when Vantiq is called in.

Capability	Vantiq	Hyperscaler services (assembled)	IoT / edge platforms	AI agent frameworks	Event streaming
Real-time event processing	●	◐	◐	○	●
One application across edge and cloud	●	◐	◐	○	○
AI orchestration built in	●	◐	○	●	○
Human-in-the-loop operations	●	○	○	◐	○
Evolve systems while they run	●	○	◐	○	◐
Ultra-fast time to production	●	○	◐	◐	◐

● *Full* ◐ *Partial or assembled* ○ *Limited. Category-level assessment.*

Hyperscaler services can do much of this, but only by assembling about eight services (for example event routing, workflow orchestration, function execution, AI workflows, edge runtimes and an agent runtime) plus agents at each edge site. IoT and edge platforms connect devices but are not built for AI orchestration or human-in-the-loop operations. Agent frameworks are strong on AI but do not run real-time operations at the edge. Event-streaming platforms move data but do not decide or orchestrate actions.

Every alternative is strong in one or two rows. Assembling several of them leaves the customer owning the integration, security and maintenance of all those pieces, and that hidden cost is usually what causes the failure Vantiq is called in to fix. Vantiq runs on hyperscaler infrastructure and uses their AI models, while removing the need to assemble many separate services.

Two other approaches, and where Vantiq differs

Two other kinds of platform are sometimes considered for the same problems, and each is strong in its own setting. Enterprise data platforms organize an organization's data into a shared model, often called an ontology, and build analytics and AI applications on top of it. Defense command-and-control platforms fuse sensor and weapon data into a single operational picture, and are typically offered alongside the vendor's own autonomous systems. Vantiq differs in five ways.

- **Event-first, not model-first.** Enterprise data platforms begin by modeling the organization, then act on that model. Vantiq begins with the event. It reacts the moment something changes, with context drawn from the systems already in place, so an operation does not need to be fully modeled before it can respond.
- **Coordination, not only analysis.** Vantiq runs the whole loop of sensing, deciding, acting and confirming, with defined AI roles, a critic and human approval for consequential actions. It can sit alongside an existing data platform and coordinate the response across the systems and people involved.
- **Horizontal and vendor-neutral.** Defense command-and-control platforms are built around military missions and are often paired with the vendor's own hardware. Vantiq is not tied to any hardware or sector. It connects the equipment a customer already owns, in healthcare, manufacturing, energy and cities as well as defense and security.
- **The edge is the starting point.** Logic runs at the edge as part of one application with the cloud, so responses stay immediate when the connection is slow or lost. This was part of Vantiq's design from the start, not an added deployment option.
- **Built by people and AI together.** Domain experts describe what the operation needs and AI generates the application, which people review and approve. Customers do not need a large specialist team for every new application, and applications evolve while they run.

For these reasons Vantiq can work alongside these platforms as well as in place of them: each system connects once, and Vantiq coordinates the response.

11. Working With Vantiq

Vantiq is a platform for continuous operations across AI, live data, people and systems. Its focus is orchestrating real-world operations: real-time execution across edge and cloud, human oversight and operational continuity, and systems that evolve while they run.

1. **Start with a high-value operation.** Healthcare, disaster response, manufacturing, energy, logistics and defense are typical starting points. Choose a single, well-defined operation with a clear owner and a measurable result.
2. **Expand at your pace.** Extend a proven deployment to more sites, workflows and connected assets on the same platform, without disrupting operations.
3. **Deliver with partners.** Systems integrators and technology partners, including NTT DATA and NEC, package repeatable industry solutions on Vantiq.

> **What this means for you**
>
> Value grows as you extend Vantiq to more operations, without replacing the systems you already have.

12. A Highly Experienced Team

Vantiq's founders and leaders have built and scaled enterprise infrastructure companies before, and its board and advisors bring deep experience in defense, healthcare, telecommunications, finance and public safety.

Name	Role	Background
Marty Sprinzen	CEO and Founder	CEO and Founder, Forte; VP International and VP Engineering, Ingres; VP Development, Candle
Paul Butterworth	CTO and Founder	CTO and Founder, Forte; CTO, AmberPoint and Emotive; Chief Architect, Ingres
David Anderson	CRO, US, UK, Europe and Defense	VP, Amazon Cloud Migrations; President, TTEC Digital; Managing Partner, TCS; Global Managing Partner, IBM
Miguel Nhuch	CRO, APAC, Middle East and LATAM	VP Business Development at Forte, Entrust and WebLogic; VP Sales, Tableau
Katherine Rincon	CMO	CMO, GridGain and Unit21; SVP Marketing, Striim; VP Marketing, BEA WebLogic
Andrew Preston	CFO	CFO/COO, StrataVision; Managing Director, Accelerated Traction Partners
Nick Bray	VP Defense and Security	Senior Executive, Royal Air Force Reserves; Director, International Strategy, UK Ministry of Defence
Toby Eduardo Redshaw	Board	SVP Enterprise 5G, Verizon; Global CIO, AmEx and Aviva; VP Supply Chain, FedEx
John Friedman	Board	Managing Partner, Easton Capital; Managing Director, E.M. Warburg, Pincus & Co.
Alan Quasha	Board	Chairman and CEO, Quadrant Management Private Equity
Joe Grace	Advisor	CEO, Grace & Associates; CIO, US Navy Medicine; Founding Board Member, Peoples Health
Jnan Dash	Advisor	VP DB Technology and Strategy, Oracle; Senior Manager, IBM
Saurabha Bhatnagar, MD	Advisor	Chief Medical Officer, United Health; Faculty Director, Harvard Medical School
Steve Cercone	Advisor	Chief of Police, CA; Founder, Safe Cities Global

Conclusion

The next frontier of AI is intelligence everywhere: AI that operates in the physical world, in real time, alongside the people accountable for the results. Getting there is an infrastructure challenge, just as electricity was. Vantiq creates that infrastructure, an operational nervous system that connects existing systems, orchestrates AI and people, builds in trust, and evolves while it runs.



- **AI for the physical world:** an operational nervous system for real-time operations.
- **Automated creation:** people and AI create applications together and reach production fast.
- **Rapid evolution:** applications evolve while they run, as IoT devices, AI models and products change.
- **Start at your speed:** begin with one operation and expand without disruption.
- **Proven enterprise-class platform:** deployed in mission-critical operations with NTT DATA, NEC and Texas A&M.
- **Partnerships for go-to-market:** repeatable industry solutions through systems integrators and technology partners.

To discuss a first project, contact Vantiq at vantiq.com