Spotlight, sponsored by:
Cyient

Spares and Service Excellence: From Reactive Cost Centers to Predictive Revenue Engines

Written by:

Mukesh Dialani
Research Vice President, IDC

Published:

July 2026

By architecting and enabling agentic AI across spares management, field service, and aftermarket operations, anchored to a unified engineering intelligence platform, industrial enterprises can transform their service function from a reactive cost center into a predictive, outcome-driven revenue engine. This paper spotlights Cyient's role in enabling this transformation for its customers.

.

Situation overview

Aftermarket services are a critical revenue driver for industrial enterprises in aerospace, energy equipment, and medical devices, yet most still manage it reactively. Industrial aftermarket performance is fundamentally a data management problem. The core operational gaps that drive aftermarket cost and service failure include:

- Bill-of-materials (BOM) data that does not reflect current engineering design
- Asset performance records that are siloed from service planning systems
- Warranty and root cause analysis (RCA) workflows that depend on manual data entry across disconnected platforms
- Service execution processes that cannot access the integrated operational intelligence required to position the right parts, at the right time, at the right location

These gaps persist despite substantial investments in enterprise resource planning (ERP), computerized maintenance management systems (CMMS), and field service management platforms over the past two decades. The systems that hold the data required for intelligent aftermarket management, specifically product lifecycle management (PLM) for engineering and parts master data, ERP for procurement and inventory, Internet of Things (IoT) platforms for asset telemetry, and field service systems for work order and parts consumption history, are not designed to communicate with each other. The result is that *aftermarket operations are managed using fragmented, inconsistently governed data that is months or years out of date at the point of consumption*.

In addition, this fragmentation is compounded by the widening divide between structured and unstructured data. Transactional records in ERP and PLM capture only part of the picture. Rich aftermarket signals, including technician notes, inspection images, service reports, sensor telemetry, sit in unstructured form and rarely reach the engineering feedback loop. Unifying structured and unstructured data is critical to monetization, as demand

At a glance

Key stats

IDC's global survey of service lifecycle management (SLM) decision makers reveals:

- 48.7% prioritize increasing service-related revenues
- 47.9% cite faster response to product quality and service issues as a top driver
- 39.6% aim to use information from action product/asset performance to improve service outcomes

Source:2025 Product Innovation and Aftermarket Services Global Survey — Key Findings

What's important

- Fragmented BOM data and the absence of a live PLM-to-service connection are the structural root of aftermarket underperformance — driving excess inventory, parts identification failures, and first-visit failures that no field productivity investment can overcome.
- AI-enabled predictive spares management — underpinned by live IoT demand signals, dynamic inventory recalculation, and autonomous replenishment — transforms spares inventory from a capital burden into a competitive asset and foundation for outcome-based service contracts.
- Scaling beyond pilots demands a unified AI operating model, not point solutions. Enterprises deploying AI on fragmented, ungoverned parts and service data hit the same wall: capable technology that fails at enterprise scope.

forecasting and parts identification improve dramatically when they are unified under a common foundation.

The engineering data and service execution gap

Parts catalog accuracy is a particularly pervasive problem. In most industrial enterprises, the service BOM is maintained separately from the engineering record, updated manually, and is not in sync with current design. When parts are updated or substituted, the field service system is the last to know. Field engineers arrive at assets with incorrect or obsolete parts, first-visit failure rates remain stubbornly high, and the trust that customers place in service commitments erodes over time. In aerospace maintenance, repair, and overhaul (MRO), the stakes are higher: a parts identification error is not merely a service productivity issue but a potential airworthiness compliance event, raising BOM accuracy from an operational concern to a regulatory one.

Disconnected warranty and RCA workflows compound the problem further. In most industrial enterprises, warranty claims, field service records, and engineering BOMs live in disconnected systems, making failure mode identification slow, manual, and disconnected from the engineering feedback loop that helps prevent repeat failures. The result is that warranty costs remain persistently high, repeat failures recur, and asset performance data that could drive proactive quality intervention is never used. Connecting warranty and RCA workflows to a live data foundation is one of the highest-value, least-addressed opportunities in aftermarket transformation.

The supply chain and forecasting gap

Supply chain performance in industrial aftermarket operations is constrained by the same data fragmentation problem that affects field service, but with a different cost imperative. Reactive supply chain management, meaning parts are staged only after work orders are raised, combining fixed reorder-point rules that don't adjust for changing demand, results in two issues. Slow-moving categories build up excess inventory, while high-demand categories experience stockouts. The working capital tied up in excess and obsolete inventory across large industrial enterprises represents a material balance sheet exposure, while the expedited costs and service penalties from stockouts erode aftermarket margins.

Demand forecasting for industrial spares is more complex than consumer or manufacturing demand forecasting. Parts failure rates are driven by asset utilization patterns, environmental conditions, maintenance history, and design lifecycle factors that are not captured in historical consumption data alone. Yet most enterprises still forecast spares demand based on historical consumption, a backward-looking strategy that systematically underperforms in environments characterized by variable utilization, aging fleets, and evolving asset configurations. Integrating live IoT telemetry into demand forecasting models represents the most significant near-term opportunity to improve forecast accuracy and reduce both excess inventory and emergency procurement costs.

The aftermarket revenue opportunity being left unrealized

For most industrial OEMs and asset operators, aftermarket services carry structurally higher margins than the original equipment sale yet remain systematically undermonetized by reactive operating models. Performance and availability-based service contracts, where the provider is compensated for asset uptime rather than parts and labor consumed, require predictive intelligence and operational responsiveness that most service organizations don't yet possess. Without accurate demand forecasting, proactive parts positioning, and reliable service events execution, committing to performance contracts is economically risky, leaving significant long-term service revenue on the table.

The emergence of spares-as-a-service commercial models, in which the service provider takes ownership of inventory positioning, demand forecasting, and replenishment in exchange for a recurring revenue arrangement, represents the strategic endpoint of aftermarket transformation. Getting to this state requires data infrastructure, AI-enabled predictive spares management, and the organizational capability and commercial confidence to price and execute outcome-based contracts at scale.

The aftermarket revenue imperative is sharpest in industries characterized by heavy assets, long asset lifecycles, and where the service and support revenue streams compound over decades of installed base operation.

The aftermarket revenue imperative is sharpest in industries characterized by heavy assets, long asset lifecycles, and where the service and support revenue streams compound over decades of installed base operation. Aftermarket services in aerospace can represent 40% of total revenue, reflecting the MRO-intensive nature of certificated aircraft and engine programs. This portion can be higher for energy equipment manufacturers, where uptime criticality in power generation and oil and gas drives intensive service infrastructure. Medical devices contribute a similar share from aftermarket, underpinned by regulatory servicing requirements and the high cost of unplanned equipment failure in clinical environments. Discrete manufacturing sectors, by contrast, typically generate a lower share of aftermarket revenue, reflecting shorter asset lifecycles and less intensive service obligations. This distribution underscores why industries with long-lived, safety-critical, or availability-critical assets stand to gain the most from the transition to predictive, AI-enabled aftermarket operations.

Market and technology forces reshaping aftermarket operations

Buyer expectations are shifting toward outcome-based service accountability

Industrial enterprises evaluating aftermarket transformation partners are no longer seeking technology capabilities in isolation. The most sophisticated buyers, those managing large, geographically distributed asset fleets under performance-based contracts, expect their engineering and AI services partners to bring three capabilities:

- Deep domain expertise across the specific asset types, failure modes, and service delivery models that focus on their industry;
- A platform architecture that eliminates the need to integrate point solutions into a fragmented technology stack; and
- Commercial models that align the partner's financial incentives with the buyer's business and operational outcomes. Partners who can demonstrate credible paths to first time-right rate improvement, inventory reduction, and forecast accuracy gains, and who are willing to share the financial risk of achieving them, will get a premium seat at the table.

The agentic AI inflection point in aftermarket operations

The transition from AI copilots, which assist human decision-makers in aftermarket planning and field service execution, to agentic AI systems that autonomously manage routine aftermarket workflows represents a strategic operational inflection point.

- The economic case for agentic AI in aftermarket operations is straightforward: the volume of routine, rule-based decisions involved in spares replenishment, parts identification, service scheduling, and order execution is far larger than the volume that human operators can process efficiently.
- An agentic system that autonomously manages replenishment for a parts catalog of tens of thousands of SKUs, monitoring consumption patterns, adjusting reorder quantities based on IoT demand indicators, routing urgent procurement to backup suppliers, and generating purchase orders within defined parameters, releases human expertise for the high-judgment decisions that genuinely require it.

The prerequisite for agentic AI that is trustworthy in industrial aftermarket environments is the same data foundation, domain knowledge graph, and governance architecture that makes AI reliable in any enterprise context. Human-in-the-loop governance frameworks, in which autonomous agents operate within defined parameters and escalate to human decision-makers for high-risk, high-value, or out-of-policy situations, represent the practical implementation model that aligns AI capability with the risk tolerance of aftermarket organizations operating under availability-based service commitments.

Role of Cyient in enabling this transformation

Cyient is a global intelligent engineering services company with $870 million in revenue (FY25) and 17,000 associates headquartered in Hyderabad, India. Aerospace and defense is Cyient's largest and longest-established vertical, a practice built over three decades of sustained engagement with engine OEMs, airframe manufacturers, and maintenance, repair & overhaul (MRO) service providers. Cyient partners with Fortune 500 aerospace and energy OEMs and medical device companies across their aftermarket engineering and operations functions. In aerospace aftermarket specifically, Cyient brings more than 2,500 aerospace subject matter experts, 400+ quality engineers, and direct operational experience in engine MRO support, including participation in material review board (MRB) processes, quality notification (QN) approval workflows, and concession assessment, giving the company first-hand knowledge of the data architectures, regulatory compliance requirements, and parts management challenges that define the aerospace aftermarket. Beyond aerospace, Cyient's aftermarket and service lifecycle capabilities extend across rail, energy, mining, and communications, where the structural challenges of data fragmentation, reactive planning, and paper-based compliance take industry-specific forms but share the same platform and methodology requirements.

Cyient's aftermarket and service lifecycle practice spans the full value chain: from engineering-to-service BOM translation and dynamic parts catalog management, to predictive demand intelligence and inventory optimization, field service planning, order execution automation, and the spares-as-a-service commercial model enablement. The company's combination of engineering domain depth, with more than 30 years of experience navigating complex, regulated environments in aerospace, rail, and energy, combined with AI platform maturity, positions it distinctively in the market.

Engineering intelligence platform: the architectural foundation for service excellence

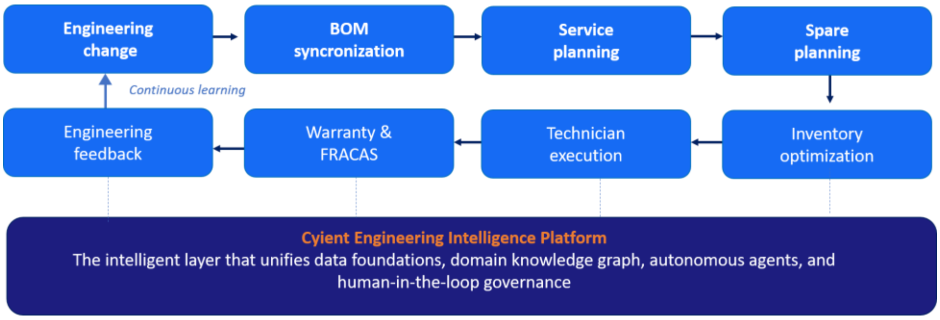
Cyient’s Engineering Intelligence Platform (EIP) is a purpose-built, seven-layer AI operating system for engineering domains that directly addresses the AI operating model problem, specifically the absence of a unified data layer, integration architecture, and governance framework that prevents most aftermarket AI initiatives from scaling beyond proof of concept (see Figure 1).

Figure 1: ***Cyient's Engineering Intelligence Platform***

Source: Cyient, 2026

Cyient's EIP occupies a distinct position in the technology landscape: it is neither a pure-play AI platform nor an ERP system, and this distinction matters operationally. Pure-play AI providers are optimized for model capability and are not purpose-built for the domain-trained ontologies, engineering data connectors, and human-in-the-loop governance requirements of regulated industrial environments. ERP systems provide transactional process coverage but were not designed to ingest unstructured engineering data, learn from fleet health telemetry, or orchestrate autonomous agents across service workflows. EIP is designed to bridge this by combining a governed, domain-specific intelligence layer with bidirectional enterprise connectivity, enabling AI to act within existing enterprise systems rather than alongside them. As shown in Figure 2, it provides the foundational infrastructure required to connect engineering data to service execution, link IoT demand data to inventory optimization models, and deploy autonomous agents that manage routine aftermarket workflows within governed parameters.

Figure 2. ***The connected aftermarket operating model***



Source: Cyient, 2026

The EIP architecture separates the intelligence layer, comprising agents, models, and orchestration, from the foundational layers of data ingestion, knowledge base construction, and enterprise connectivity, enabling each to evolve independently. This separation is operationally important for aftermarket environments where the underlying data sources, including asset telemetry, parts consumption records, and supplier catalogs, change continuously and where AI models must be updated as demand patterns shift without disrupting the production workflows that depend on them.

Agentic AI at work

Cyient operationalizes their EIP through a set of domain-trained agents that execute routine aftermarket workflows within governed parameters escalating decisions to human experts when required. The following showcase a few examples:

Agentic type	What it does	Business impact
Spare demand agent	Monitors consumption patterns and IoT telemetry, adjusts reorder quantities, and routes urgent procurement to backup suppliers within defined parameters.	Fewer stockouts and less excess and obsolete inventory
BOM Intelligence Agent	Reconciles the service BOM against the current engineering record and flags part substitutions and obsolescence.	Higher parts-catalog accuracy and fewer wrong-part field visits
Engineering Change Agent	Propagates engineering changes into service planning, parts master data, and field documentation.	Faster engineering-to-service synchronization
Warranty Intelligence Agent	Assembles warranty and RCA data across systems, identifies failure modes, and feeds the engineering loop.	Lower warranty cost and fewer repeat failures
Service Scheduling Agent	Matches parts, technician skills, and asset availability to open work orders.	Higher first-time-fix rates

Source: Cyient, 2026

The four transformation vectors

Cyient's industrial aftermarket transformation landscape identifies four vectors that together define the path from reactive cost management to predictive revenue generation. These vectors are not sequential, as progress on each reinforces the others, but they have a natural sequencing logic that starts with data foundation and builds toward autonomous operations.

Vector	Current state	AI-enabled target state
Stock-to-cash acceleration Business vector	Fixed inventory rules lock capital in dead stock across disconnected systems. No dynamic recalculation as demand patterns change.	Global optimization through AI-maintained digital thread frees excess inventory capital and establishes a single source of truth from PLM.
Outcome-based inventory Service vector	Static demand forecasting based on spreadsheets with no IoT input. Reactive supplier staging after work orders are raised.	Live IoT demand trends drive continuous AI recalculation. Parts are staged before work orders exist, eliminating emergency procurement.
Field productivity leap Technology vector	Manual parts enablement results in high first-visit failure rates. Field engineers spend significant time identifying parts rather than resolving issues.	AI-enabled engineers receive context-aware parts guidance per job, achieving materially higher first-time fix rates and eliminating wasted field visits.
Forecast-to-margin Market vector	Reactive performance contracts without IoT connectivity produce wide spares fulfillment forecast errors and extended fulfillment lag times.	Live IoT demand patterns and autonomous order agents enable Spares-as-a-Service commercial models, converting aftermarket from a cost center to a revenue engine.

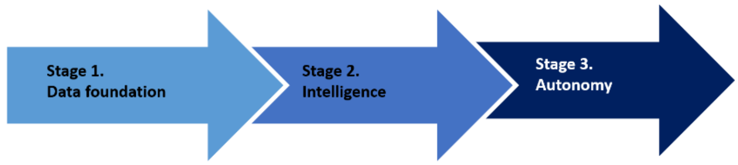
Source: Cyient and IDC, 2026

Industrial aftermarket and service operations are approaching an inflection point. The enabling technology conditions, namely agentic AI capable of managing complex multi-step aftermarket workflows, domain-trained models that understand industrial parts relationships and failure modes, and integration platforms that can connect decades of legacy operational technology with modern AI infrastructure, are sufficiently mature to support production-grade deployment today. The limiting factor is no longer technology capability. It is the data foundation and governance architecture that make AI trustworthy at enterprise scale, and this is where Cyient provides value.

Delivering on this requires navigating execution realities that no technology partner can sidestep. Fragmented data across PLM, ERP, IoT, and partner networks limit preventive maintenance, accurate parts forecasting, and AI impact. Internal AI skills, change management hurdles, and pilot fatigue hinder value realization. For industrial enterprises, weak linkages between service, engineering, supply chain, and sales can slow feedback loops for improving asset reliability and service quality over time. As autonomous agents take on greater procurement responsibility, governance frameworks defining agent authority, escalation thresholds, and audit trails become a compliance requirement, not a technical afterthought. Cyient's three-horizon roadmap provides a practical path through each of these realities, starting with an engineering data foundation, layering in predictive intelligence, and building toward autonomous operations only after the governance architecture is in place.

IDC views this sequencing logic, starting with data foundation, followed by intelligence and autonomy, as operationally sound and reflective of how organizations progress from reactive, fragmented operations toward predictive and ultimately autonomous service models (see Figure 3).

Figure 3. ***The aftermarket maturity curve***



Source: Cyient, 2026

The EIP architecture's separation of platform infrastructure from the intelligence layer is particularly relevant for aftermarket environments where asset configurations, demand patterns, and parts catalogs change continuously. Cyient's outcome-based and risk-reward commercial models that share financial exposure on inventory reduction targets, first-time-right improvement, and forecast accuracy gains align its incentives directly with the business outcomes that matter to the operational and supply chain leaders accountable for aftermarket performance. The plowback financing logic, where early inventory savings fund subsequent AI scaling investments, reduces the capital commitment required to initiate transformation and creates a self-funding momentum that is particularly relevant for enterprises operating under capital allocation constraints. IDC views willingness to engage in outcome-based structures as a meaningful differentiator in the industrial aftermarket services market.

Conclusion

Essential guidance

For COOs and VPs of Service Operations, Supply Chain, and Asset Management

- **Define the aftermarket business model first.** Focus on spares-as-a-service arrangements, availability-based contracts, or predictive maintenance subscriptions and work backward to define the operational capabilities required.
- **Elevate the aftermarket data agenda to board-level priority.** Secure the investment, organizational authority and cross-functional commitment required to establish and maintain the data standards that AI models depend on.
- **Redesign commercial incentives with predictive service outcomes.** Ensure internal KPIs, supplier agreements, and partner incentives align with service performance outcomes.
- **Invest in reskilling pathways.** Identify and invest in planners, supply chain managers, and field engineers to work alongside AI systems, augmenting human judgment on complex decisions, not eliminating the expertise that makes those decisions reliable.

For CIOs, CTOs, VPs of Engineering, and Chief Digital Officers

- **Resolve BOM and parts master data before deploying AI**. Commission a rigorous assessment of BOM accuracy, parts catalog completeness, and PLM-to-service synchronization gaps before committing to enterprise-scale programs.
- **Architect for IoT integration from day one:** Predictive demand intelligence requires live asset telemetry, not historical consumption data. Ensure bidirectional IoT connectivity is a core infrastructure requirement from the outset; retrofitting it later will cost significantly more.
- **Select partners on industrial domain depth and integration track record.** Focus on domain expertise as a compulsory capability requirement, and not a differentiating preference. It should be driven by regulatory requirements, heterogeneous asset configurations, irregular parts failure modes, and supplier catalog complexity.
- **Demand outcome-based commercial structures.** Collaborate with partners who are willing to share financial exposure. A partner's willingness to engage on these terms is a signal of commitment and confidence in delivering at enterprise scale.

The bottom line

Organizations that connect engineering, supply chain, service delivery and AI into a unified intelligent platform are best placed to meet their customers' business and technology aspirations.

The transformation of industrial aftermarket operations from reactive cost management to AI-powered service excellence is a current competitive imperative, not a future aspiration. Enterprises investing now in data foundation, platform architecture, and governance frameworks are building aftermarket capabilities that reactive competitors will find difficult to replicate. Delay is not neutral, as every quarter without BOM accuracy, IoT connectivity, and AI operating models that enable predictive aftermarket operations consumes valuable time. This leads to excess inventory, emergency procurement costs, and first-visit failure rates, all of which continue to erode margins that should be invested in service capability and customer relationships.

The path to the spares-as-a-service commercial model requires sustained investment, disciplined sequencing, and a partner with the industrial domain expertise to navigate the data, organizational, and commercial challenges that technology alone cannot resolve. Cyient's three decades of engineering depth across aerospace, rail, energy, and industrial markets, its purpose-built EIP, and outcome-based commercial models position it as a transformation partner for enterprises serious about converting their aftermarket function from a cost center into a competitive advantage.

The question is not whether AI will transform industrial spares management and field service because the economics and technology make that inevitable. The question is whether organizations will build the foundation required to lead the transformation or wait while their competitors capture the advantages that predictive service excellence enables.

About the IDC analyst

Mukesh Dialani
Research Vice President, IDC

Mukesh Dialani leads IDC's coverage of the Worldwide Digital Engineering and Operational Technology Services market. His research agenda spans the full lifecycle of product and industrial engineering, from product engineering services and PLM-enabled digital transformation to operational technology services, IIoT, Physical AI, and the AI and agentic technology platforms reshaping how engineering organizations design, manufacture, and service industrial assets. He covers Cyient and other leading engineering services providers across the aerospace, energy, rail, automotive, and industrial machinery sectors. Mukesh is based in the United States.

More about Mukesh

Message from the sponsor

Cyient delivers intelligent engineering solutions across products, plants, and networks for over 300 global customers, including 30% of the top 100 global innovators. Cyient addresses fragmented service operations, disconnected product data, rising maintenance costs, and limited asset visibility that constrain aftermarket performance, service profitability, and customer experience across the Aerospace & Defense industry. Its AI-enabled Asset & Service Lifecycle Management operating model is built on the Engineering Intelligence Platform (EIP). EIP is a seven-layer architecture that embeds predictive, prescriptive, and autonomous intelligence across technical publications, service planning, spare parts management, asset reliability, MRO, and field service operations. EIP is powered by AI agents for Service Planning, Spare Parts Intelligence, Intelligent Technical Publications, Reliability & FRACAS, Obsolescence Management, and Maintenance Decision Support. The platform accelerates service readiness, improves first-time fix rates, optimizes asset availability, enhances lifecycle cost efficiency, and ensures compliance with industry standards while enabling a connected digital thread across the aftermarket ecosystem.

Learn more about Cyient

IDC Custom Solutions

IDC Research, Inc.

One Beacon Street, Suite 33100, Boston, MA 02108, USA

T +1 508 872 8200

blogs.idc.com | LinkedIn @IDC | www.idc.com