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**CUSTOMER
VALUE LEADER**

Maximizing the Price/Performance ROI for Customers

*RECOGNIZED FOR BEST PRACTICES IN THE
GLOBAL AUTOMATED WHEEL MEASUREMENT
FOR RAIL INDUSTRY*

F R O S T & S U L L I V A N

Table of Contents

<i>Best Practices Criteria for World-class Performance</i>	3
Railway Maintenance Innovation: The Shift towards Automation	3
Expanding the Customer Base through Targeted Market Strategies	4
Maximizing Uptime and Efficiency in Railway Operations with CALIPRI X	5
Driving Innovation and Geographical Expansion with a Diversified Portfolio	6
Boosting ROI and Delivering Lasting Value through Customer-centric Innovations	7
Building Trust through Quality and Commitment	8
<i>Conclusion</i>	9
<i>What You Need to Know about the Customer Value Leadership Recognition</i>	10
Best Practices Recognition Analysis	10
Business Impact	10
Customer Impact	10
<i>Best Practices Recognition Analytics Methodology</i>	11
Inspire the World to Support True Leaders	11
<i>About Frost & Sullivan</i>	12
The Growth Pipeline Generator™	12
The Innovation Generator™	12

Best Practices Criteria for World-class Performance

Frost & Sullivan applies a rigorous analytical process to evaluate multiple nominees for each recognition category before determining the final recognition recipient. The process involves a detailed evaluation of best practices criteria across two dimensions for each nominated company. Hexagon AB excels in many of the criteria in the automated wheel measurement for rail space.

RECOGNITION CRITERIA	
<i>Business Impact</i>	<i>Customer Impact</i>
Financial Performance	Price/Performance Value
Customer Acquisition	Customer Purchase Experience
Operational Efficiency	Customer Ownership Experience
Growth Potential	Customer Service Experience
Human Capital	Brand Equity

Railway Maintenance Innovation: The Shift towards Automation

Railway systems are vital for trade and passenger transport, and wheelset maintenance is central to safety, efficiency, and performance. Historically, wheel measurement was a labor-intensive process prone to human error and inconsistencies.¹ Technicians relied on handheld gauges and visual inspections while struggling to keep pace with the increasing demands of a rapidly expanding and modernizing railway network.² Frost & Sullivan notes that these limitations often led to reactive maintenance strategies, which addressed wear and defects only after they had become significant, resulting in costly downtime and safety risks. Today, the railway industry faces a global skilled labor shortage and growing pressure to digitize and automate. At the same time, Frost & Sullivan points out that interoperability requirements (e.g., the European Union’s Technical Specifications for Interoperability) emphasize the need for standardized, precise data across rail networks.³

Modern automated measurement systems address these challenges with non-contact laser and optical technologies that deliver sub-millimeter accuracy, repeatable results, and rapid inspections. These systems enable predictive maintenance (thereby reducing equipment failures), extend asset lifecycles,

¹ https://www.researchgate.net/publication/390275665_Optimizing_Railway_Safety_and_Efficiency_A_Comprehensive_Review_on_Advancements_in_Out-of-Round_Wheel_Detection_Systems

² Ibid.

³ https://www.era.europa.eu/domains/technical-specifications-interoperability_en

and improve operational resilience. Stockholm-based Hexagon AB is at the forefront of this transformation with its CALIPRI portfolio, including the fully automated on-track CALIPRI X and the analytics-enabled CALIPRI Predictor. Together, these solutions provide continuous, data-driven wheelset profiling and predictive insights, helping operators transition from rigid, interval-based inspections to smarter, safer, and more cost-effective railway operations.

Expanding the Customer Base through Targeted Market Strategies

“Hexagon AB’s integrated portfolio streamlines customers’ procurement decisions and supports long-term partnerships by addressing operational challenges and future scalability needs. For instance, CALIPRI X eliminates time-consuming manual inspections and delivers precise results within seconds, showcasing measurable value to prospective customers.”

**- Rabin Dhakal,
Best Practices Research Analyst**

Founded in 1975, Hexagon AB is a global leader in design, measurement, and visualization technologies, with metrology at its core. Through NEXTSENSE, a Hexagon company and a recognized domain expert in metrology, the firm builds on nearly two decades of leadership in handheld wheel measurement with its CALIPRI C4X range. In 2022, CALIPRI X, an automated on-track wheelset measurement system, was launched. The company co-developed it with close input from rail operators to ensure real-world reliability across seasons, geographies, and wear conditions. It combines non-contact precision with digital analytics to enhance safety and efficiency in wheelset management and empower rail operators with

predictive maintenance capabilities.

Hexagon AB’s integrated portfolio streamlines customers’ procurement decisions and supports long-term partnerships by addressing operational challenges and future scalability needs. For instance, CALIPRI X eliminates time-consuming manual inspections and delivers precise results within seconds, showcasing measurable value to prospective customers. Its compliance with the European standard (EN 15313) ensures accuracy and regulatory alignment across parameters such as wheel profile, diameter, equivalent conicity, camber, and wheel toe.⁴ This reliability differentiates CALIPRI X and helps operators transition from interval-based checks to condition-based predictive maintenance, reducing costs and optimizing resource allocation.

CALIPRI Predictor strengthens Hexagon AB’s customer strategy with a cloud-based storage and analytics tool that extends the value of its measurement devices. These capabilities enable customers to implement predictive maintenance schedules that enhance fleet safety and operational continuity.⁵

CALIPRI handheld and portable instrument solutions (C42 and Prime), designed for diverse railway applications, strategically broaden the company’s acquisition funnel. These solutions meet customers where they are, whether in service shops, field operations, or high-speed rails, and deliver accurate and reproducible results independent of operator influence. They remove the variability of manual gauges and bulky fixtures, enabling quick digital transfers of results and serving customers seeking immediate operational improvements and long-term modernization. The solutions’ stackable design further

⁴ <https://hexagon.com/ko/resources/resource-library/adding-accuracy-and-availability-to-automatic-train-wheelset-measurement>

⁵ <https://www.calipri.net/en/products/railway-predictive-maintenance>

enhances acquisition by allowing customers to start small and scale up as operational demands grow, lowering barriers to entry and encouraging progressive adoption.⁶

In parallel, Hexagon AB's customer engagement model strengthens acquisition and retention. The company's consultative sales approach aligns solutions to each customer's requirements, while rapid implementation and seamless integration minimize operational disruption. Comprehensive training, support hotlines, and knowledge platforms help customers realize return on investment (ROI) from day one. Importantly, Hexagon AB secures long-term relationships through extended service guarantees, including contracts of up to 15 years for CALIPRI X.⁷ This assurance resonates strongly with railway operators that make capital-intensive investments.

Frost & Sullivan commends Hexagon AB for combining innovative technology, flexible solution pathways, and customer-first engagement. These strategies deliver measurable value, accelerate new-customer wins, and build enduring partnerships.

Maximizing Uptime and Efficiency in Railway Operations with CALIPRI X

Hexagon AB's CALIPRI X overcomes temperature-related drift, a persistent challenge in automated wheel measurement. Its design employs paired sensor boxes, precision-linked with steel bars, and supported by advanced software algorithms that compensate for predictable thermal expansion. Internally, a fluid-based heating and cooling system maintains all electronics and sensors at a steady 20° Celsius (C). Additionally, the company uses Invar (a nickel-iron alloy with an exceptionally low thermal expansion coefficient) in CALIPRI's critical components.⁸ This combination virtually eliminates measurement errors, extends component lifetimes, and reduces lifecycle costs, allowing operators to maintain peak system efficiency in extreme summer and winter conditions.

Operational excellence is also evident in Hexagon AB's ability to maintain sensor accuracy under real-world track stresses. Operators can fully decouple CALIPRI X from the rails via screw piles, ensuring stability even under wheel loads exceeding 30 tons and rail deflections of up to two centimeters.⁹ The patented CALIPRI Principle automatically corrects for sensor tilt, guaranteeing accuracy regardless of wheel size, position, or wear condition. This distinct competitive advantage minimizes measurement variability and rework by operators.

Unlike conventional systems with sliding protective doors prone to jamming and delays, Frost & Sullivan notes that CALIPRI X eliminates all moving parts through compact and reinforced sensor windows, ensuring minimal damage exposure. This design improves availability and confirms that the system is "always on" and ready for immediate measurement, enhancing productivity within depots where every minute of operational downtime translates to cost. Moreover, self-cleaning functionality maintains uptime. It continuously clears recessed sensor windows using bursts of compressed air, supported by a continuous airflow during measurements that repels water, dirt, and debris. The smooth, low-profile

⁶ Hexagon's presentation deck

⁷ Ibid.

⁸ <https://www.calipri.net/en/products/wayside-monitoring-system>

⁹ Ibid.

housing prevents the accumulation of snow, leaves, or ballast dust, cutting manual cleaning and ensuring uninterrupted operations.

CALIPRI X on a Railway Track



Source: Hexagon AB

By keeping results comparable across seasons, locations, and varying operating conditions, Hexagon AB eliminates small, compounding errors that can distort maintenance decisions. This meticulous, standards-based approach delivers highly reliable insights that boost workforce productivity, streamline processes, and minimize total cost of ownership for railway operators.

Driving Innovation and Geographical Expansion with a Diversified Portfolio

The CALIPRI brand, widely recognized as the benchmark for wheel profiling in railways, drives market adoption and customer loyalty through its proven precision, reliability, and compliance. Certification by Deutsche Bahn (DB) Systemtechnik and trust from premium global operators and manufacturers, including Deutsche Bahn DB (Germany), Wiener Linien (Austria), Fleetcare (Finland), SNCF (France), SBB (Switzerland), ÖBB (Austria), and leading operators in the United States (US),¹⁰ solidifies Hexagon AB's position as a partner of choice for mission-critical measurement applications.

The company's financial trajectory reflects profitable, sustainable expansion, with a mid-single-digit compound annual growth rate between 2020 and 2024, an installed base exceeding 4,000 units, and growing monetization through software and services.¹¹ Notably, software already contributes 37% of revenue and after-market services 27%,¹² underlining the success of a recurring revenue model that strengthens customer relationships.

The CALIPRI portfolio is aligned with high-demand markets: 82% in maintenance, repair, and overhaul (MRO) for railway operations, 15% in flush and gap measurement, and 3% in miscellaneous applications.¹³ This strong MRO focus ensures steady demand, while emerging opportunities in automation,

¹⁰ Hexagon's presentation deck

¹¹ Ibid.

¹² Ibid.

¹³ Ibid.

cloudification of rail and automotive solutions, and new vertical applications in aerospace provide clear avenues for expansion.

Geographically, NEXTSENSE, part of Hexagon AB since 2018, has a strong base in Europe, the Middle East and Africa (about 74%), with significant growth potential in the Americas (about 7%) and Asia (approximately 19%).¹⁴ Targeted opportunities in the UK, US, and India for rail, and the US, China, and India for automotive applications, position the company to scale in fast-growing regions. With a global presence and local execution, NEXTSENSE (part of Hexagon AB) leverages a robust ecosystem of around 40 sales partners worldwide and turnkey collaborations with system integrators to deliver scalable solutions tailored to customer needs.

“CALIPRI stands out in automated wheel profile inspection, widely recognized for its superior measurement data quality and lowest total cost of ownership. The system requires minimal track modifications during installation, and its maintenance is limited to an annual calibration, which reduces the operational burden compared to competing solutions that have moving parts and demand regular lubrication or risk mechanical failure.”

**- Ram Ravi, Industry Principal,
Growth Opportunity Analytics**

Additionally, NEXTSENSE benefits from a highly specialized team of approximately 80 professionals, 95% of whom are based in Graz, Austria.¹⁵ Their expertise spans firmware, electronics, metrology, algorithms, application software, and image processing, core competencies that fuel innovation in automation, cloud-driven software, and advanced measurement intelligence. Tight collaborations between research and development, technical support, repair, calibration, and product management teams ensure that customers receive high-quality, continuously evolving solutions.

Frost & Sullivan is impressed with Hexagon AB’s ability to combine global scale with local expertise, recurring revenue streams with product innovation, and a trusted brand with expanding vertical reach.

Boosting ROI and Delivering Lasting Value through Customer-centric Innovations

CALIPRI stands out in automated wheel profile inspection, widely recognized for its superior measurement data quality and lowest total cost of ownership. The system requires minimal track modifications during installation, and its maintenance is limited to an annual calibration, which reduces the operational burden compared to competing solutions that have moving parts and demand regular lubrication or risk mechanical failure. CALIPRI X’s design ensures fast deployment on existing tracks, whether in front of depots, workshops, washing facilities, or sidings, making frequent, cost-free measurements a reality without disrupting fleet operations.

Integrating CALIPRI X with CALIPRI Predictor further amplifies the value proposition. Automated, cloud-based storage and analytics provide real-time insights into fleet condition, enabling predictive maintenance, reducing downtime, and extending asset lifecycles. Secure 24/7 global accessibility to results boosts productivity for maintenance teams, fleet managers, and workshop operators.

¹⁴ Ibid.

¹⁵ Ibid.

The approach to customer engagement emphasizes long-term partnerships, reliability, and continuous value creation. Customers are supported throughout their journey, with solutions that scale alongside them and provide tailored, high-quality support for evolving needs.

Wiener Linien: Driving Predictive Maintenance at Scale

Wiener Linien, Austria's largest regional transportation service provider, carrying nearly two million passengers daily with the support of 8,700 employees, opted for CALIPRI X for fast, precise, and repeatable performance.¹⁶ Its deployment enables enhanced condition-based predictive maintenance, reduced downtime, optimized resource planning, and significantly lower maintenance costs. Wiener Linien has had three CALIPRI X systems in operation since 2022, with plans to deploy nine by 2025.

ÖBB Stadler Service GmbH: Automating Precision at High Speed

Similarly, ÖBB STADLER Service GmbH started with the CALIPRI C42 handheld system before expanding its toolkit in 2023 by adopting the CALIPRI X on-track system.¹⁷ Installed directly before the maintenance hall, the CALIPRI X provides automated, high-precision wheel profile measurements at speeds of up to 30 kilometers per hour, delivering results within seconds. This innovation eliminates time-intensive manual inspections and dramatically reduces the time spent on maintenance facilities.

IGE GmbH & Co. KG: Modernizing with Digital Accuracy

Hexagon AB strengthens customer experience by modernizing long-standing industry practices.¹⁸ IGE GmbH & Co.KG (IGE), a household name in European railway operations for over three decades, transitioned from outdated manual caliper-based measurements to Hexagon AB's optical measurement technologies. Through CALIPRI Prime, a laser-based handheld device, IGE benefits from user-independent, micrometer-level accuracy and fully digitalized workflows.

These case studies highlight how Hexagon AB embeds its commitment to customer ownership in every engagement. By aligning its technological innovations with customer priorities, the company delivers cutting-edge solutions and establishes enduring partnerships built on trust, operational value, and continuous improvement.

Building Trust through Quality and Commitment

CALIPRI is a symbol of trust, reliability, and long-term partnership. Its brand identity rests on four pillars: quality and reliability, achieved through rigorous standards upheld by its 80 employees; customer orientation, where client needs consistently shape the product and service experience; trust and transparency, emphasized through clear and open communication; and long-term commitment, ensuring that customer relationships extend far beyond the initial purchase. Together, these principles translate into a consistently positive customer perception.

Growth initiatives also fortify brand visibility, with targeted expansion into new markets and the consistent delivery of high-impact solutions. People and company culture are central to this strategy; a

¹⁶ This section is based on: <https://hexagon.com/resources/resource-library/automated-wheelset-measurement-system-enables-predictive-maintenance>

¹⁷ This section is based on: <https://railway-news.com/enhancing-wheelset-measurement-efficiency/>

¹⁸ This section is based on: <https://hexagon.com/resources/resource-library/digitalisation-of-wheel-profile-measurement>

collaborative, fair, and respectful environment, laying the foundation for lasting partnerships rooted in mutual support and accountability.

Above all, CALIPRI's customer-focused tactic differentiates its brand. The company connects customers on rational and emotional levels, acknowledging their daily challenges and offering tailored solutions. Frost & Sullivan is impressed with Hexagon AB's customer-centric ethos, which supports CALIPRI's high brand equity and demonstrates that the company's reputation extends beyond products to represent a sustained commitment to customer success.

Conclusion

Hexagon AB's CALIPRI portfolio integrates precision, automation, and predictive analytics into a single, cohesive portfolio, revolutionizing wheel profile measurement in the railway sector. The company shifts wheel checks from labor-intensive, manual inspections to a reliable, non-contact system that enhances operational efficiency, safety, and sustainability. With CALIPRI X and CALIPRI Predictor, Hexagon AB delivers immediate value and forward-looking insights, while its handheld and portable solutions expand accessibility across diverse railway applications.

Deutsche Bahn certification further reinforces the portfolio's credibility. This validation is a critical endorsement that substantiates CALIPRI as a trusted benchmark solution for rail operators globally. The company demonstrates operational excellence by engineering solutions that withstand real-world railway stress, require minimal maintenance, and offer the lowest total cost of ownership in the market. Its brand equity, strengthened by NEXTSENSE's metrology expertise and nearly two decades of proven leadership, positions CALIPRI as the benchmark for wheel measurement globally. Customers view Hexagon AB as a provider of advanced instrumentation and a trusted partner for support, scalability, and operational success.

With its strong overall performance, Hexagon earns the 2025 Frost & Sullivan Global Customer Value Leadership Recognition.

What You Need to Know about the Customer Value Leadership Recognition

Frost & Sullivan's Customer Value Leadership Recognition is its top honor and recognizes the market participant that exemplifies visionary innovation, market-leading performance, and unmatched customer care.

Best Practices Recognition Analysis

For the Customer Value Leadership Recognition, Frost & Sullivan analysts independently evaluated the criteria listed below.

Business Impact

Financial Performance: Strong overall business performance is achieved in terms of revenue, revenue growth, operating margin, and other key financial metrics

Customer Acquisition: Customer-facing processes support efficient and consistent new customer acquisition while enhancing customer retention

Operational Efficiency: Company staff performs assigned tasks productively, quickly, and to a high-quality standard

Growth Potential: Growth is fostered by a strong customer focus that strengthens the brand and reinforces customer loyalty

Human Capital: Leveraging innovative technology characterizes the company culture, which enhances employee morale and retention

Customer Impact

Price/Performance Value: Products or services offer the best ROI and superior value compared to similar market offerings

Customer Purchase Experience: Purchase experience with minimal friction and high transparency assures customers that they are buying the optimal solution to address both their needs and constraints

Customer Ownership Excellence: Products and solutions evolve continuously in sync with the customers' own growth journeys, engendering pride of ownership and enhanced customer experience

Customer Service Experience: Customer service is readily accessible and stress-free, and delivered with high quality, high availability, and fast response time

Brand Equity: Customers perceive the brand positively and exhibit high brand loyalty, which is regularly measured and confirmed through a high Net Promoter Score®

Best Practices Recognition Analytics Methodology

Inspire the World to Support True Leaders

This long-term process spans 12 months, beginning with the prioritization of the sector. It involves a rigorous approach that includes comprehensive scanning and analytics to identify key best practice trends. A dedicated team of analysts, advisors, coaches, and experts collaborates closely, ensuring thorough review and input. The goal is to maximize the company's long-term value by leveraging unique perspectives to support each Best Practice Recognition and identify meaningful transformation and impact.

VALUE IMPACT			
STEP		WHAT	WHY
1	Opportunity Universe	Identify Sectors with the Greatest Impact on the Global Economy	Value to Economic Development
2	Transformational Model	Analyze Strategic Imperatives That Drive Transformation	Understand and Create a Winning Strategy
3	Ecosystem	Map Critical Value Chains	Comprehensive Community that Shapes the Sector
4	Growth Generator	Data Foundation That Provides Decision Support System	Spark Opportunities and Accelerate Decision-making
5	Growth Opportunities	Identify Opportunities Generated by Companies	Drive the Transformation of the Industry
6	Frost Radar	Benchmark Companies on Future Growth Potential	Identify Most Powerful Companies to Action
7	Best Practices	Identify Companies Achieving Best Practices in All Critical Perspectives	Inspire the World
8	Companies to Action	Tell Your Story to the World (BICEP*)	Ecosystem Community Supporting Future Success

*Board of Directors, Investors, Customers, Employees, Partners

About Frost & Sullivan

Frost & Sullivan is the Growth Pipeline Company™. We power our clients to a future shaped by growth. Our Growth Pipeline as a Service™ provides the CEO and the CEO's growth team with a continuous and rigorous platform of growth opportunities, ensuring long-term success. To achieve positive outcomes, our team leverages over 60 years of experience, coaching organizations of all types and sizes across 6 continents with our proven best practices. To power your Growth Pipeline future, visit Frost & Sullivan at <http://www.frost.com>.

The Growth Pipeline Generator™

Frost & Sullivan's proprietary model to systematically create ongoing growth opportunities and strategies for our clients is fuelled by the Innovation Generator™.

[Learn more.](#)

Key Impacts:

- **Growth Pipeline:** Continuous Flow of Growth Opportunities
- **Growth Strategies:** Proven Best Practices
- **Innovation Culture:** Optimized Customer Experience
- **ROI & Margin:** Implementation Excellence
- **Transformational Growth:** Industry Leadership



The Innovation Generator™

Our 6 analytical perspectives are crucial in capturing the broadest range of innovative growth opportunities, most of which occur at the points of these perspectives.

Analytical Perspectives:

- **Megatrend (MT)**
- **Business Model (BM)**
- **Technology (TE)**
- **Industries (IN)**
- **Customer (CU)**
- **Geographies (GE)**

