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Software defines premium

The 7 Pillars on how lifecycle control creates real capability
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Background

The foundations of software-defined products were established in the early 1970s, when new U.S. safety and emissions regulations aligned with the emergence of the first microprocessors. Mechanical systems could no longer meet performance and compliance demands alone; software became essential for control, optimization, and continuous improvement.

Over the following decades, ECUs multiplied, diagnostics matured, and connectivity entered the mainstream. The introduction of 4G enabled real-time data flows, remote services, and the first scalable over-the-air updates. By the 2020s, increasing system complexity and rising cybersecurity and safety requirements made software quality, traceability, and lifecycle management central to both operational performance and brand value.

This transition now extends far beyond the automotive sector. Products across all industries are becoming connected, software-supported platforms, and business models are shifting toward lifecycle services, upgrades, and data-driven value creation. Even conservative sectors such as defense and security are adopting software-centric architectures to ensure long-term capability, interoperability, and mission readiness.

This report outlines The 7 Pillars that define premium in a software-intensive world and explains how traceability, secure updates, and lifecycle control transform technical complexity into sustainable customer value.

The Concept: 7 pillars

Modern products are no longer defined by materials or mechanical design alone. Their performance, reliability, and long-term customer value increasingly come from software – how it is developed, deployed, updated, secured, and managed across the entire lifecycle. Modern products are no longer defined by materials or mechanical design alone. Their performance, reliability, and long-term customer value increasingly come from software – how it is developed, deployed, updated, secured, and managed across the entire lifecycle.

The 7 Pillars present a unified model for building software-defined products that improve over time, remain secure, and deliver measurable operational value:

1. Delivery excellence
Traceability of all software and hardware components to ensure stable production, controlled ramp-up, and supply chain integrity.

2. Innovation & co-innovation
Structured software processes and collaborative development models that accelerate capability growth and enable new service-driven business models.

3. Operational performance superiority
Uptime, resilience, and continuous performance improvement enabled by diagnostics, predictive maintenance, and remote interventions.

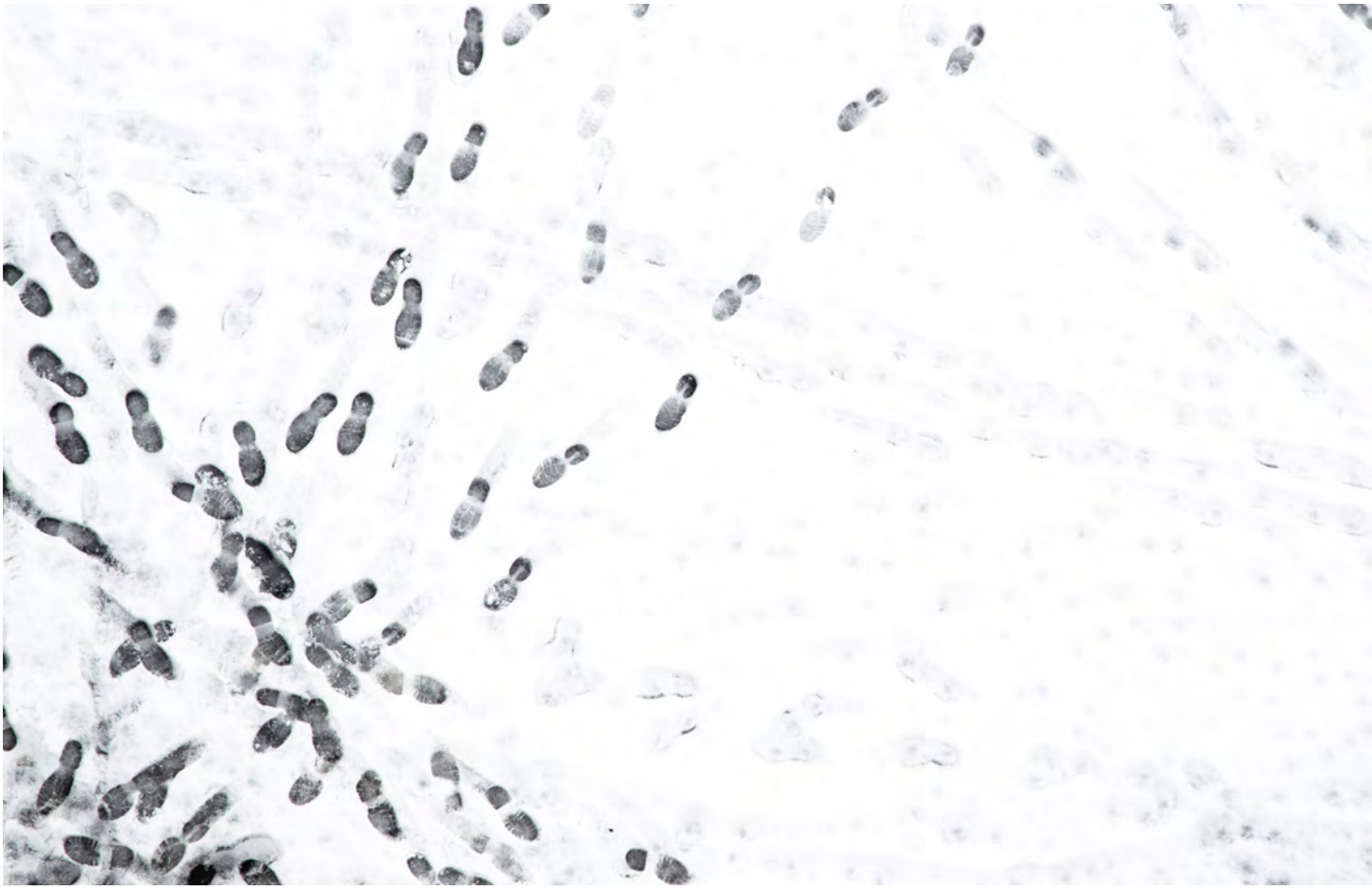
4. User-friendly design & experience
Software management systems that support operators with clear control, monitoring, and follow-up – driving real operational efficiency.

5. Customer relationship & services
Digital service infrastructure, remote diagnostics, and fleet management enabling faster, proactive, and more transparent customer support.

6. Constant upgrades
Secure updates and OTA capabilities that keep products safe, current, and continuously improving throughout their lifecycle.

7. Sustainability
Longer operational lifetime, modular upgrades, and secure lifecycle management –reducing waste and strengthening societal, operational, and environmental resilience.

Together, these pillars create the foundation for products that remain capable, competitive, and trustworthy throughout long service lives. Organizations that adopt this model move from static product delivery to continuous value delivery – where software is the primary driver of premium performance.



1.
Delivery excellence.
Traceability of all software and hardware parts.

Delivery excellence begins with full traceability of every software and hardware element in a product. As systems become increasingly software-defined, visibility into versions, configurations, and component origins is essential for stable industrialization, controlled ramp-up, and secure supply chains.

Software and hardware now evolve together. Without precise traceability, organizations cannot ensure consistent quality, regulatory compliance, or fast issue resolution. In high-volume production, even minor deviations can scale into systemic failures, making verified configurations critical.

For both commercial and defense applications, authenticating every part and software package is now a baseline requirement. Traceability enables predictable delivery, reduces operational risk, and reinforces customer trust in products expected to perform reliably over long lifecycles.

2.

Innovation and co-innovation.

Processes for software handling and business models for software-enabled products.

Innovation in software-defined products depends on structured processes for software handling – ensuring that new features, updates, and improvements can be developed, integrated, and deployed reliably throughout the product's life.

Co-innovation strengthens this capability. By aligning suppliers, partners, and customers around shared architectures and roadmaps, organizations accelerate development and create solutions that match real operational needs.

As products become connected platforms, business models evolve as well. Value shifts from one-time sales to continuous services, upgrades, and data-driven offerings – all enabled by secure, well-managed software.

Together, these elements allow companies to deliver ongoing customer value and differentiate through sustained innovation rather than static product releases.

3.
Operational performance superiority.
Increased uptime and added capabilities over time.

Operational performance superiority is achieved by embracing new technologies that enhance system reliability and long-term functionality. In software-defined products, performance is no longer fixed at delivery; it evolves continuously through updates, optimizations, and feature additions.

Increased uptime is the most direct outcome. Remote monitoring, predictive diagnostics, and rapid software interventions reduce unplanned stops and shorten recovery times. Systems remain available, responsive, and mission-ready.

Equally important is the ability to add capabilities over time. New features, improved algorithms, security enhancements, and performance upgrades can be delivered digitally, extending the product's relevance without physical modification.

Together, these advancements create a product that improves throughout its lifecycle – delivering sustained operational value, lower total cost of ownership, and a measurable competitive advantage.

4.
User-friendly design and experience.
Software management systems that drive operational efficiency.

User-friendly design in software-defined products extends far beyond appearance. It encompasses the systems, interfaces, and workflows that enable users to control, monitor, and manage complex operations with clarity and precision.
Effective software management systems provide structured access to configurations, updates, diagnostics, and performance data. By simplifying complex tasks and presenting actionable insights, they reduce operational burden and improve decision-making.

In practice, this means users can track system status, follow up on deviations, plan maintenance, deploy updates, and manage capabilities through a coherent, intuitive environment. The result is higher efficiency, fewer errors, and faster response times.
When design and functionality align, organizations gain a user experience that directly supports operational excellence – turning complexity into manageable, predictable, and value-generating workflows.

5.
Customer relationship and services.
Maintenance, fleet management, and faster service delivery.

Customer relationships in a software-defined environment are built on continuous support rather than one-time transactions. Maintenance, fleet management, and rapid service response all become interconnected elements of an integrated service strategy.

Software-enabled diagnostics and monitoring allow issues to be identified earlier and resolved faster, reducing downtime and improving operational predictability. Fleet management systems provide real-time visibility across distributed assets, enabling more efficient planning, utilization, and lifecycle decisions.

By combining accurate data with streamlined service processes, organizations can deliver faster interventions, proactive maintenance, and tailored support. This elevates customer satisfaction and strengthens long-term relationships.

Outstanding customer service is ultimately enabled by software: it ensures transparency, improves responsiveness, and supports the reliable operation of every product in the field.

6.
Constant upgrades.
Secure updates and OTA capabilities.

In software-defined products, performance improvements continue long after delivery. Secure and continuous upgrades ensure that systems evolve to meet new operational demands, address vulnerabilities, and unlock additional value throughout their lifecycle.

Secure update mechanisms protect the integrity of each software package, validating authenticity and preventing unauthorized changes. Over-the-air (OTA) capabilities extend this process across distributed fleets, enabling updates to be deployed quickly, safely, and with minimal operational disruption.

These capabilities reduce downtime, maintain security posture, and allow organizations to introduce new features or optimizations at scale. Constant upgrades transform the product from a static asset into a continuously improving platform – supporting long-term performance, reliability, and customer trust.

7.
Sustainability.
Longer lifetime, added capabilities, security, and upgradable systems.

Sustainability in software-defined products is achieved by extending product lifetime, reducing resource use, and ensuring systems remain secure and functional over decades. When capabilities can be added through software – and hardware can be upgraded or replaced without redesigning the entire system – products stay relevant longer and generate significantly lower environmental and societal impact.
Longer lifetimes reduce waste. Added capabilities extend usefulness. Security maintains trust and operational safety. And modular upgrades enable products to evolve without replacing entire platforms.

For industries critical to society – such as transportation, energy, marine, and defense – sustainability is not only an environmental commitment but a strategic responsibility. Software-defined products support resilient operations, protect communities, and reduce the burden on global supply chains.

Sustainability becomes a measurable outcome when systems are designed to last, to improve, and to remain secure throughout their lifecycle.

Technical recommendations.

To achieve the performance, reliability, and lifecycle value expected from software-defined products, organizations must establish a coherent technical foundation spanning development, industrialization, operations, and service.

A first requirement is end-to-end traceability of all software and hardware elements. Secure signing, configuration tracking, and supplier integration ensure controlled ramp-up, stable production, and fast root-cause analysis when deviations occur.

Equally important are structured software handling processes. Standardized build and integration workflows, supported by automated testing and reproducible environments, enable continuous innovation and create the basis for new service-oriented business models.

Operational excellence depends on high-availability architectures. Real-time diagnostics, predictive maintenance, and remote recovery capabilities increase uptime and maintain consistent performance across fleets and long lifecycle horizons.

To support operators and technicians, organizations must provide user-focused management systems that simplify version control, updates, configuration handling, and health monitoring. Clear, reliable tools directly improve operational efficiency and reduce errors.

Long-term customer value is strengthened through digital service infrastructure, including remote diagnostics, fleet management, event-driven maintenance, and centralized service portals.

Underpinning all of this is the need for secure and scalable update mechanisms – local or OTA – that guarantee authenticity, support rollback, and meet modern cybersecurity requirements.

Finally, modular and upgradable architectures extend product lifetime by enabling hardware replacement, software enhancement, and capability additions without major redesigns.

Together, these capabilities form the technical backbone required for software-defined products to remain secure, competitive, and future-proof.

Want to learn more?

Reach out at any time if you'd like to learn more about Diadrom and what we can offer to you and your company.

About Diadrom

Diadrom is a Solution and Software Company with focus on diagnostics of Autotech and Autodefense. The company was founded in 1999 and has most of the customer base in the automotive sector. Other customer sectors include MedTech, industrial machinery, defence, security, and public transport. Diadrom is traded on NASDAQ OMX First North Growth Market (ticker DIAH). The headquarters is in Gothenburg, and we have customers all over the world.

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