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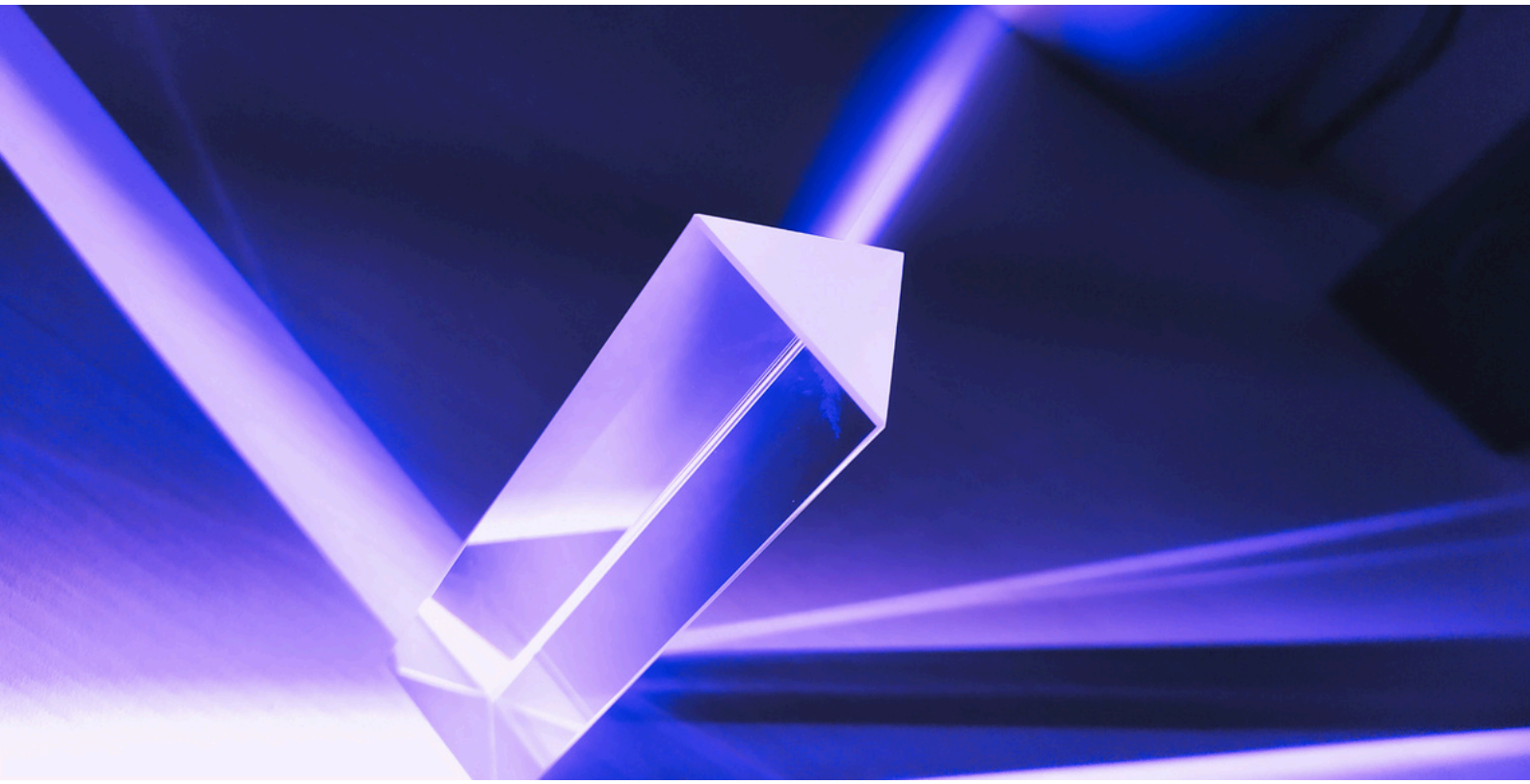

E-book | February 2026

Tuomas Eerola

The MultiphysicsAI guide to turning physics into business advantage

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Introduction to MultiphysicsAI

The executive guide to multiphysicsAI

This book outlines how MultiphysicsAI can drive measurable business impact by modernizing engineering workflows and business decision-making in fast growing industries, such as automotive, aerospace, consumer devices, and medical devices.

It presents a practical path from traditional digital product development to scalable, democratized multiphysics product intelligence; driving innovation, accelerating time to market, and enabling better decisions across the organization, from engineering and R&D to product management, sales, and leadership.

The vision: From analysis to discovery

For decades, engineering simulations and virtual validation tools have been the domain of a small group of experts. Traditional tools were built to answer one question: "What happens if I build this design?". This creates slow and costly iterative loops of prototyping and testing where a single high-fidelity simulation can take hours or even days.

MultiphysicsAI changes the equation. By combining the numerical rigor of physics-based simulation with the pattern-recognition power of AI, we allow you to invert your workflow. Instead of merely modeling existing designs, we create the data needed to discover entirely new ones.

> By analysing large and complex datasets, AI enables faster concept validation especially for complex systems, predictive modelling and optimised design processes, reducing reliance on costly physical prototypes.
>
> AI also helps to identify risks early on, minimise inefficiencies and align product development more accurately with market demand.

Source: PwC, Innovate smarter: How AI is transforming Research and Development, 2025.
https://www.pwc.com/gx/en/services/ai/ai-in-research-and-development.html

Introduction to MultiphysicsAI

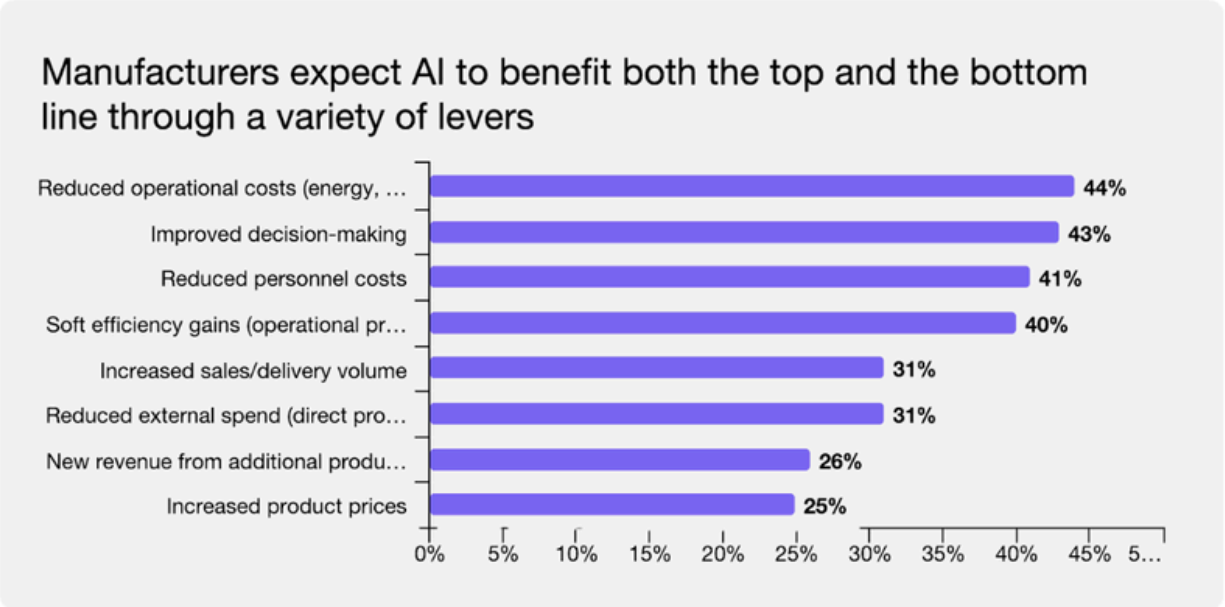
What is MultiphysicsAI?

MultiphysicsAI is a workflow methodology developed by Quanscient for training physics-aware AI models that are ready to support your internal and customer-facing teams from innovation to R&D and sales.

We leverage the massive scalability of the Quanscient Allsolve to generate large volumes of high-quality physics data. This data provides the "ground truth" for an AI model that understands the relationship between design variables and performance outcomes.

The power of speed: While a typical traditional engineering simulation run requires minutes or hours, a trained MultiphysicsAI model can execute product-related predictions at over 100,000 evaluations per second to support your business decisions with physics-aware artificial intelligence.

Explore our MultiphysicsAI white papers at **quanscient.com/multiphysicsai**



Source: PwC, AI in operations: Revolutionising the manufacturing industry, Base 406.
https://www.pwc.com/gx/en/services/consulting/digital-operations/ai-in-operations.html

Introduction to Quanscient

We equip engineers to rapidly explore thousands of design options for the world's most complex challenges — to refine to an optimal solution with precision and confidence.

Learn more at quanscient.com ⟶

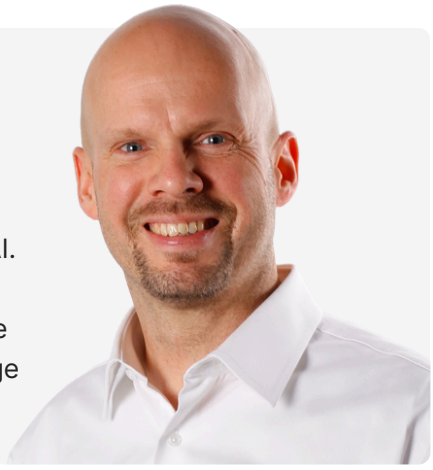
Quanscient

- Quanscient was founded in Tampere, Finland in 2021 to improve accessibility and performance in engineering simulation.
- Quanscient Allsolve, a cloud-native multiphysics simulation platform was created by combining expertise in algorithms, cloud development, software business and quantum technologies.
- Continued growth is driven by platform innovation, team expansion, digital product development on native quantum computers, and MultiphysicsAI, which turns Quanscient Allsolve data into fast, physics-aware predictions for confident design decisions.

Trusted in both industry and academia

UK Atomic Energy Authority · Infineon · Massachusetts Institute of Technology · Proxima Fusion · imec · Paul Scherrer Institut PSI

Tuomas Eerola



Tuomas has extensive experience helping businesses address digital product development challenges using engineering simulations, cloud-powered high-performance computing, and AI.

Since 2025, he has been leading sales at Quanscient, helping the digital R&D forerunners achieve increasing competitive advantage with Quanscient Allsolve, the cloud-based simulation platform.

The role-based advantage of MultiphysicsAI

In the traditional R&D model, simulation is often a bottleneck; a slow, iterative process that answers "What happens if I build this?"

MultiphysicsAI flips the script. It transforms simulation from a cost center into a **competitive engine of discovery**. By training AI on physics-accurate data, you stop guessing and start knowing.

Let's take a look at the advantages of MultiphysicsAI for different roles.

Simulation Analyst

Removes the simulation bottleneck, allowing you to focus on high-value expert analysis rather than repetitive runs.

Data Analyst

Integrates physics intelligence into your favorite AI stack, enabling the creation of AI agents that design the future.

Head of R&D

Shortens development cycles from months to hours and unlocks complex problems with inverse questions.

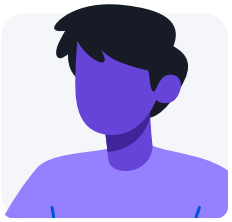
Head of Sales

Accelerates quotations and safeguards margins. It helps ensure technical feasibility and enables a rapid response to RFx.

COO

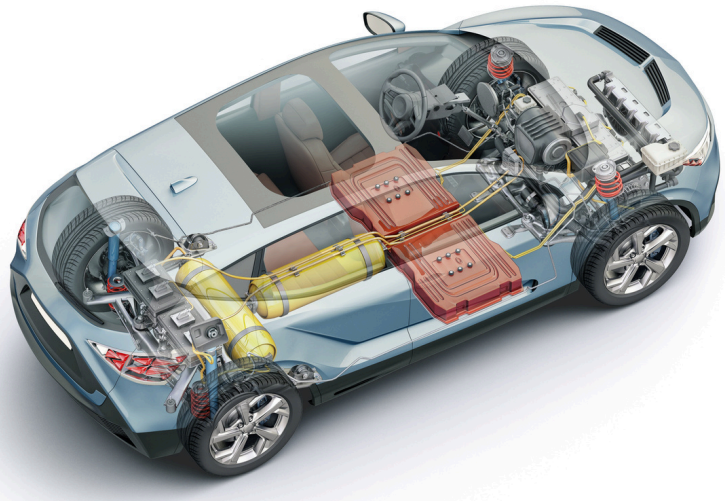
Improves production yield and protects margins through more accurate quotations in custom manufacturing.

Chairman



Enhances business value and enables a strategic shift toward AI-augmented Research and Innovation.

Industry
Automotive



Protecting safety and margins

The status quo: The race for autonomous driving is stalled by the "calibration trap." Matching MEMS sensors to vehicle vibrations requires months of physical testing and incremental simulations.

The new reality: Achieve "first-time-right" precision. MultiphysicsAI allows you to see the entire operating envelope of an Inertial Measurement Unit (IMU) before a single chip is manufactured.

Strategic impact: Time-to-market. In the automotive sector, being six months late to a platform launch can result in millions in lost tier-1 contracts.

The ROI factor: By eliminating just 1.5 physical prototype cycles, you save €187,500 per product line in direct costs.

Executive perspective: This isn't just a cost saving; it's a risk mitigation strategy that reduces the likelihood of expensive safety-related recalls and protects brand valuation.

> Save **€187,500** per product line in direct costs by eliminating just 1.5 physical prototype cycles.

Industry
Aerospace

> Accelerate **time-to-orbit** by months, cut down the design time **from 3 weeks to 8 hours**.

Securing the “new space” moat

The status quo: Mission-critical timing devices must survive extreme thermal shifts. Traditionally, validating these designs for the harsh environment of Low Earth Orbit (LEO) takes weeks of high-performance computing (HPC) time.

The new reality: Speed as a strategic weapon. MultiphysicsAI allows you to cut down the search for the ideal temperature-compensated resonator design for the mission from 3 weeks to 8 hours.

Strategic impact: Resourcing efficiency. Your senior PhD engineers stop babysitting simulations and start focusing on innovative architectures.

The ROI factor: Accelerating "time-to-orbit" by months translates directly into early-mover advantages and the ability to secure restricted government and commercial satellite contracts.

Executive perspective: In a capital-intensive industry, accelerating the R&D cycle improves cashflow velocity. You move from "spending" to "revenue" faster than the competition.

Industry
Consumer devices

> Move yield from 70% to 90%, **recover millions in profit** without increasing material costs.

Maximizing EBITDA through yield

The status quo: In high-volume consumer electronics, a 70% manufacturing yield is often accepted as the "cost of doing business." When producing millions of MEMS microspeakers, that 30% waste is a direct hit to your bottom line.

The new reality: Yield-driven design. MultiphysicsAI helps you navigate an universe with nonlinearities to identify "sweet spots" where your design will be immune to manufacturing tolerances.

Strategic impact: Quality and consistency. Delivering 30% higher Sound Pressure Level (SPL) with lower distortion creates a premium product that commands higher retail margins.

The ROI factor: Moving yield from 70% to 90% at scale is equivalent to millions of euros in recovered "found" profit without increasing material costs.

Executive perspective: This is a profitability play. High-yield manufacturing improves gross margin, which is the most significant driver of company valuation in the semiconductor space.

Industry
Medical devices

Access the full MultiphysicsAI webinar **here** →

Turning supply chain volatility into a strategic advantage

The status quo: You've spent years perfecting the PMUT (Piezoelectric Micromachined Ultrasonic Transducer) array design for your handheld diagnostic scanner. Suddenly, a new batch of piezoelectric material arrives from your vendor, and the final devices are falling 15% outside of sensitivity specs.

Traditionally this triggers a "crisis loop". You investigate the production line, and when nothing is wrong there your senior laboratory experts spend weeks performing tests to find the culprit. Meanwhile, you're forced to choose between stalling production (killing cashflow) or shipping sub-optimal parts (risking brand reputation and regulatory compliance).

The new reality: "Inverse Design" and Instant Characterization. With MultiphysicsAI, you don't need weeks of lab work to find the needle in the haystack. You feed the "out-of-spec" performance data back into your AI model, which reverse-engineers the potential root causes for you, and points out for you that the probable reason is within the material properties of that specific batch.

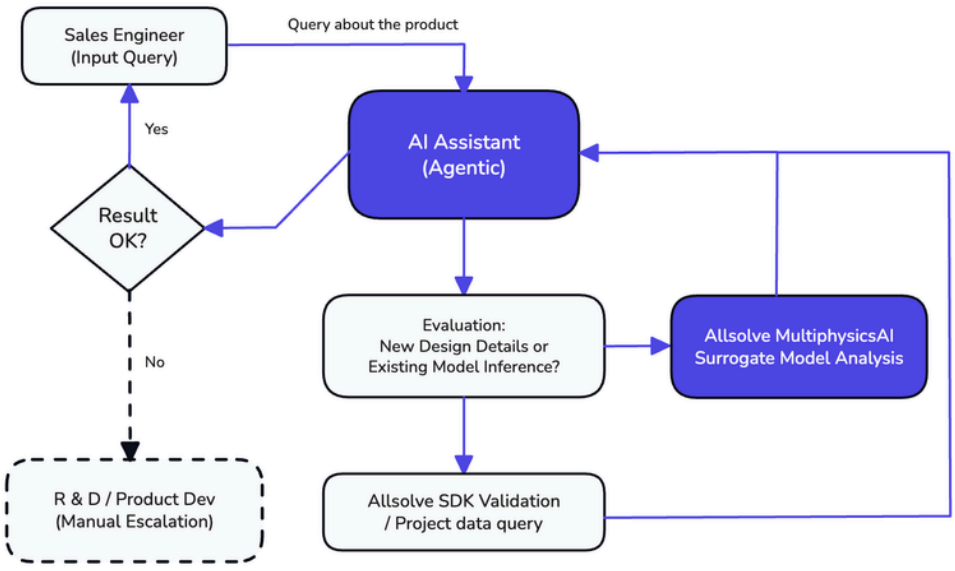
Strategic impact: Supply chain resilience. Instead of guessing why the material failed, you gain immediate visibility. You can tune your fabrication parameters to compensate for the vendor's variance or ask your vendor to correct the situation without any delay.

The ROI factor: Eliminating the "troubleshooting bottleneck". By automating material characterization, you reduce the time to resolve batch-related failures from months to days.

For a medical devices line, a one-month production delay can cost upwards of €500,000 in lost revenue and wasted engineering hours. MultiphysicsAI acts as an insurance policy, identifying the root cause of failures at 100,000 evaluations per second.

Executive perspective: Protecting EBITDA and valuation. In the medical sector, consistency is the foundation of valuation. Being able to maintain a 95% yield despite non-ideal material batches protects your gross margins and ensures you hit your quarterly revenue targets regardless of supplier hiccups.

What is next?
AI agents and democratization



Customers often ask me about my vision and how I see the future. I personally believe that we have only scratched the surface of what is possible with MultiphysicsAI. I strongly believe in democratization. My vision is that the ultimate goal is to integrate multiphysics product intelligence into company processes where traditional FEM has not previously been accessible: CRM, CPQ, ERP, and more.

Imagine a sales engineer who is not an expert in FEM being able to ask an AI agent with an approachable user interface:

"My automotive manufacturer customer wants our accelerometer to operate over a wider temperature range (–40°C to +150°C). Do we need to change the packaging material?"

The AI agent, powered by a MultiphysicsAI model, can provide an actionable answer in seconds based on real-time mechanical stress predictions. This allows the sales engineer to serve his customer quickly and demonstrate good customer service. Previously, they would have needed to consult the product development team even for this type of preliminary technical product question.

The customer would have had to wait for the answer, and the R&D team would have had an unplanned request that distracts their daily work. Now, the product development team can focus on their core work, and the design analysis does not need to be escalated to them until the RFI progresses to the next stage.

Tuomas Eerola
VP of Sales
Quanscient

Your MultiphysicsAI roadmap
A milestone-based journey

MultiphysicsAI roadmap assessment

A consultative engagement with your leadership to align AI strategy with your key business Initiatives and identify applications where the benefits will have the highest value.

Selected priority application PoC

- Architecture design: Selecting applicable AI strategy.
- Data generation: Utilizing Allsolve to create a synthetic training dataset.
- Model training and validation: Conducting AI training in a development environment.
- PoC demo: Experiencing the benefits in practice before deployment.

Rollout and deployment

Scaling the PoC into your production environment and integrating the model into your core business processes in collaboration with your IT and business application partners.

Conclusion
Lead the change

Engineering is moving from analysis to intelligence. MultiphysicsAI does not replace your engineers and analysts; it empowers them with the agility to see every feasible design and the freedom to choose the best one, and to deliver customer value.

MultiphysicsAI can drive measurable business impact by modernizing your engineering workflows and business decision-making. When connected to your R&D processes, it can drive innovation and accelerate time to market. When connected to your other enterprise processes, it can help make better decisions across the organization, from engineering and R&D to product management, sales, and leadership.

Let's take the first step together. Reach out to me directly to plan and schedule your MultiphysicsAI roadmap assessment. Let's work to align this technology with your key business initiatives, ensuring that your move toward AI-augmented R&D is not just a digital trend, but a strategic driver of your company's valuation and competitive edge.

Get in touch

Learn more and request a demo at
quanscient.com →

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