

# OVERCOMING PRODUCTION SCHEDULING INEFFICIENCIES: QUANTUM-OPTIMIZATION FOR SMOOTHER OPERATIONS

Production scheduling has become a complex exercise. It involves the coordination of intricate supply chains, variable demand patterns, and strict regulatory frameworks, all while swiftly adapting to market trends.

Effective production scheduling demands meticulous planning and agile responses, as any disruption can lead to over-or under-production, elevated costs, and missed deadlines. Traditional computing methods struggle to

keep up with the growing scale and complexity in today's manufacturing processes, which can lead to costly inefficiencies and dissatisfied customers.

## QUANTUM OPTIMIZATION: A POWERFUL SOLUTION

Quantum technology enables organizations to leverage quantum mechanical effects to solve hard problems faster and better. It is uniquely suited to address optimization problems that are prevalent across industries, including in manufacturing. Quantum-powered optimization can help accurately forecast demand and synchronize production with market needs to reduce lead times, minimize inventory costs, and improve resource allocation. The ability to make real-time adjustments means manufacturers can more rapidly respond to market changes, improve operational efficiency, and drive customer satisfaction thereby gaining a competitive edge.

Automakers, for example, must coordinate thousands of components from a global supply chain to maintain just-in-time manufacturing, all while meeting changing customer demands. Electronics manufacturers must integrate new technologies quickly while managing

a high volume of components and complying with environmental regulations. Pharmaceutical firms must align batch production with strict safety standards while swiftly adapting to shifting healthcare needs.

For today's manufacturers, D-Wave solves these and many other complex optimization problems through hybrid computing solutions that use the best of classical and quantum computing technologies. D-Wave's annealing quantum computers, boasting over 5,000 qubits, are the largest in the world. They enable organizations to leverage quantum programming to develop advanced commercial applications. Through the Leap™ quantum cloud service, customers can access hybrid solvers capable of handling problems with millions of variables and hundreds of thousands of constraints. **This secure, real-time, production-grade service offers over 99% uptime and availability.**



## BENEFITS OF QUANTUM-POWERED PRODUCTION SCHEDULING

- Streamlines processes to reduce the time and resources needed to coordinate complex tasks for operational performance improvements.
- Adjusts production schedules in real time to align with shifting market demands.
- Reduces lead times to accelerate time-to-market for products that meet customer demands.

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## USE CASE: QUANTUM OPTIMIZATION IN ACTION AT FORD OTOSAN

Ford Otosan, a joint venture between Ford Motor Company and Koç Holding in Turkey, collaborated with D-Wave to simplify elements of its Ford Transit van manufacturing processes. Aimed at optimizing its production sequencing, the solution reduced the scheduling time of 1,000 vehicles per run from 30 minutes to less than five. Moreover, the solution offered more flexibility for the manufacturer to adapt to changes in demand or auto part availability.



“We now have three different optimization algorithms, and we are able to get solutions fast enough so that when the unexpected occurs — say that a truck carrying a left side sliding door gets involved in an accident — we might be able to very quickly generate a new schedule so that the new vehicles in the schedule do not require that missing part.”

— Ziya Dalkiliç, Data Scientist at Ford Otosan

## GET STARTED NOW

Are you ready to explore how quantum optimization can meet your production scheduling needs?

With our hands-on team of experts and our Launch™ program, it's easy to reap the benefits of quantum optimization now. Our team will guide you through every step of your journey: we'll validate your use case, offer an optimized and thoroughly tested solution, and ensure a smooth path to production deployment.

**Sign up for a consultation today.**

