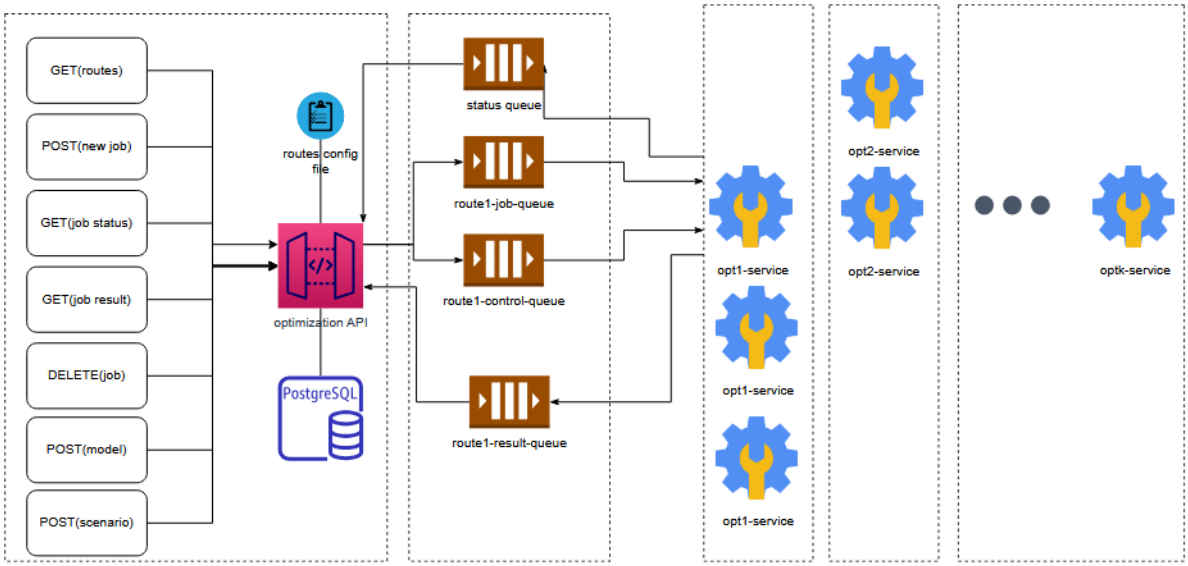
Product factsheet

optEngine

Software solution
Consulting or service offering (e.g. training)



Description

optEngine is an advanced middleware platform developed to deliver Optimization-as-a-Service (OaaS) within modern, digitally integrated manufacturing environments. It serves as a flexible interface layer between end-users and diverse backend optimization engines, enabling organizations to execute complex optimization tasks through a unified, schema-agnostic, and cloud-ready system. Designed to align with Industry 4.0 principles—such as interoperability, scalability, and responsiveness—optEngine supports both synchronous (real-time) and asynchronous workflows, making it suitable for a wide range of operational and strategic applications.

The architecture of optEngine is composed of several robust and modular components. At its core is a secure web-based API that allows users to authenticate, submit optimization jobs, monitor their status, and retrieve results. Each optimization job is assigned a unique identifier and managed by a job manager that coordinates with backend solvers. To ensure decoupled, fault-tolerant communication, the system employs RabbitMQ for durable message queuing. Data exchange within optEngine is facilitated through flexible JSON formats, while persistent storage of job data, user metadata, and results is handled by a PostgreSQL database. The platform is fully containerized using Docker, enabling reliable deployment and scalability across different environments.

optEngine's scope of application is broad, encompassing industries such as automotive, steel,

logistics, and reconfigurable production systems. It has already been deployed in real-world settings—for example, optimizing robotic pick-and-place operations in automotive kitting lines, reconfiguring layouts for efficiency, and scheduling production plans. These applications highlight optEngine's ability to improve productivity and decision-making in both real-time and long-term planning contexts.

Several key advantages set optEngine apart from existing optimization solutions. Its schema-agnostic architecture allows it to interface with heterogeneous input data without requiring structural modifications, drastically reducing integration effort. It is also solver-agnostic, capable of routing jobs to a wide variety of optimization algorithms—ranging from exact mathematical models to heuristics and AI-based methods—without code changes. This flexibility is further enhanced by its support for both real-time and batch optimization tasks, enabling users to prioritize speed or accuracy based on their operational needs. Combined with a fault-tolerant design and scalable deployment, optEngine delivers high availability and performance across different use cases.

The platform introduces several ground-breaking innovations. Most notably, it transforms optimization into a reusable, pluggable service decoupled from business-specific logic—a stark contrast to traditional, tightly integrated optimization systems. This middleware-centric approach not only improves maintainability and scalability but also democratizes access to advanced optimization tools across an enterprise. Furthermore, proposed future enhancements—such as integrating semantic technologies and ontologies—would enable optEngine to automatically classify optimization problems and match them with the most appropriate solvers, based purely on the structure and semantics of the input data. This capability would introduce a novel level of autonomy and intelligence to optimization service platforms.

In practical terms, optEngine streamlines the optimization workflow. For instance, in an automotive manufacturing line, a user might submit a job to optimize the pick-and-place sequence for a robotic system. optEngine receives the request, processes the data asynchronously, and forwards it to the relevant backend engine. Once the job is complete, the optimized result is returned to the user, allowing real-time control systems to execute faster, more efficient operations. In such scenarios, optEngine has demonstrated significant performance gains, such as reducing kit preparation time by over 20%.

Overall, optEngine represents a significant step forward in the deployment of intelligent, service-based optimization systems in manufacturing, offering unmatched flexibility, modularity, and adaptability for today's industrial challenges.

Target audience

Maufacturing Industries Process Industries

URL

https://www.optiscale.io/

Technologies applied by the product

- **Optimisation**
- **Optimization Algorithms**

Costs

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Last update: 2025-05-19