OCTAVE

EBOOK

The future of design in industrial facilities: digitalization and automation

Designing industrial facilities is a complex endeavor that requires balancing multiple objectives, such as meeting schedules, optimizing costs and ensuring safety and compliance. These projects are often burdened by outdated, manual processes that lead to inefficiencies and inaccuracies. Such practices can result in missed deadlines, increased costs and compromised safety standards.

Moreover, the industry faces increasing regulatory compliance and monitoring pressures from regulatory bodies, further complicating the design process. As organizations strive to enhance operational efficiency and competitiveness, companies must abandon outdated processes and embrace new work methods and solutions that will help them achieve project objectives within schedule.

In this eBook, we will explore solutions and related benefits that help achieve this transition provided by Octave's unified, role-based design solutions. These solutions offer real-time capabilities that can help optimize your industrial facilities by enabling immediate updates and adjustments during the design process.

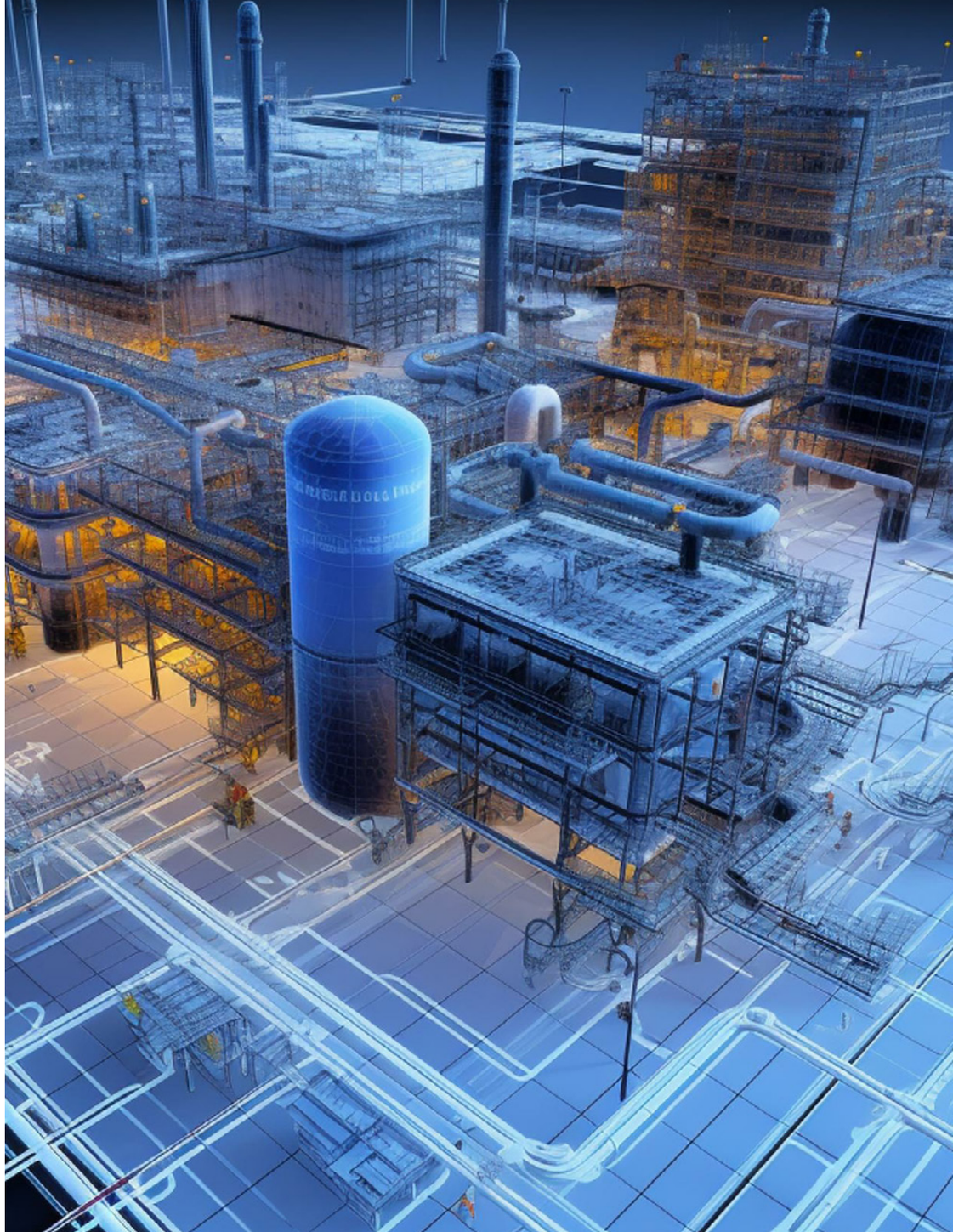
Digitalization

Industries utilizing design and analysis tools face a myriad of challenges, from project complexity and the necessity for diverse solutions, to communication barriers and the intricacies of interdisciplinary coordination. A lack of integrated systems compounds these issues. This leads to inefficiencies and potential inaccuracies. Understanding these common problems is the first step toward overcoming them.

As we continue, it becomes essential to delve into the specifics of where these bottlenecks manifest within the facility. By identifying these pain points, organizations can unlock the potential for more streamlined project workflows. This exploration will pave the way for discovering innovative solutions that enhance collaboration, boost productivity and ultimately drive successful project outcomes.

Automation

Automation is at the heart of Octave's approach to industrial design. This capability involves automating a range of routine tasks, such as data entry, model updates and report generation, which reduces the manual workload and enhances efficiency. For instance, Octave's solutions can automatically generate bills of materials (BOMs) and perform clash detection to identify potential design conflicts early in the process. These processes enable seamless collaboration and data-driven decision-making. This ensures that design data is effectively utilized across the asset lifecycle. By integrating disparate systems, Octave empowers organizations to focus on strategic objectives and deliver superior results. This approach not only improves efficiency but also enhances the agility and responsiveness of the organization. Octave's solutions provide advanced automation capabilities necessary to navigate the complexities of industrial design, ensuring that projects are executed with precision and excellence.



Interoperability

Interoperability between design and engineering tools is key to accurate industrial designs. It allows for a seamless flow of data between departments, ensuring that any changes made in the design phase are automatically reflected in engineering analysis models. This reduces errors and ensures that the designs are always aligned with performance expectations.

For effective design, solutions must enable and create smooth workflows for iteration as projects evolve and evaluate the best methods for a project's goals. The tight interoperability between Octave's design solutions and engineering analysis solutions creates ease of iteration with the confidence of accurate, code-compliant design.

The benefits of this include improved collaboration among teams, as engineers and analysts can work from a unified data set, strengthened communication and reduced time spent on revisions. It also enables more efficient workflows, as engineers can quickly test various design scenarios and optimize designs based on real-time analysis feedback. This leads to more informed decision-making and higher-quality outcomes.

Interoperability also supports compliance with industry standards, allowing for thorough testing and validation of designs against regulatory requirements. In the engineering and construction sectors, which are often characterized by tight profit margins and high levels of risk, this synergy between design and analysis tools is crucial. By enhancing productivity, reducing costs and accelerating project delivery, Octave's solutions provide a significant competitive edge. This approach not only helps companies maintain profitability but also mitigates risks associated with non-compliance and project delays, ensuring success in a fast-paced and demanding industry environment.

Solutions

Whether you are working on smaller maintenance projects or a massive capital infrastructure, having the right tools can make all the difference. Octave delivers fully integrated, rule-driven, intelligent technologies that can transform your design process, regardless of scale or complexity.

By leveraging Octave's Intergraph Smart design solutions for large-scale complex projects that require extensive data management, or CADWorx design solutions for projects needing high levels of scalability and flexibility, companies can transform older, paper-based and other manual or siloed processes into streamlined operations.

These solutions take full advantage of rule checkers, data and design reuse and are enhanced by Octave's analysis tools, including:

- Octave Aspect Pipe Stress for pipe stress analysis
- Octave Aspect Pressure Vessel for pressure vessel analysis
- Octave Aspect Structure for structural analysis
- Octave Aspect Tank for storage tank analysis
- Octave Aspect Nuclear Pipe Stress for nuclear and non-nuclear piping analysis

These solutions help ensure that designs meet compliance and performance standards.

Designers and engineers generate actionable insights that lead to improved project outcomes by embracing solutions that can help achieve preferred contractor status, optimize workforce utilization and deliver consistent, high-quality project deliverables. Octave's commitment to innovation and excellence ensures that organizations are equipped to navigate the complexities of industrial design and deliver exceptional results.

Ensure design accuracy and consistency with solutions that help reduce errors, minimize changes and rework. Discover how Octave's design solutions revolutionize the way engineers and designers approach projects by providing an integrated environment that defines and manages 3D plant models.

Octave's schematics and 3D modeling solutions include two powerful suites each with distinct advantages tailored to different scales of design projects.

About Forte 3DWorx

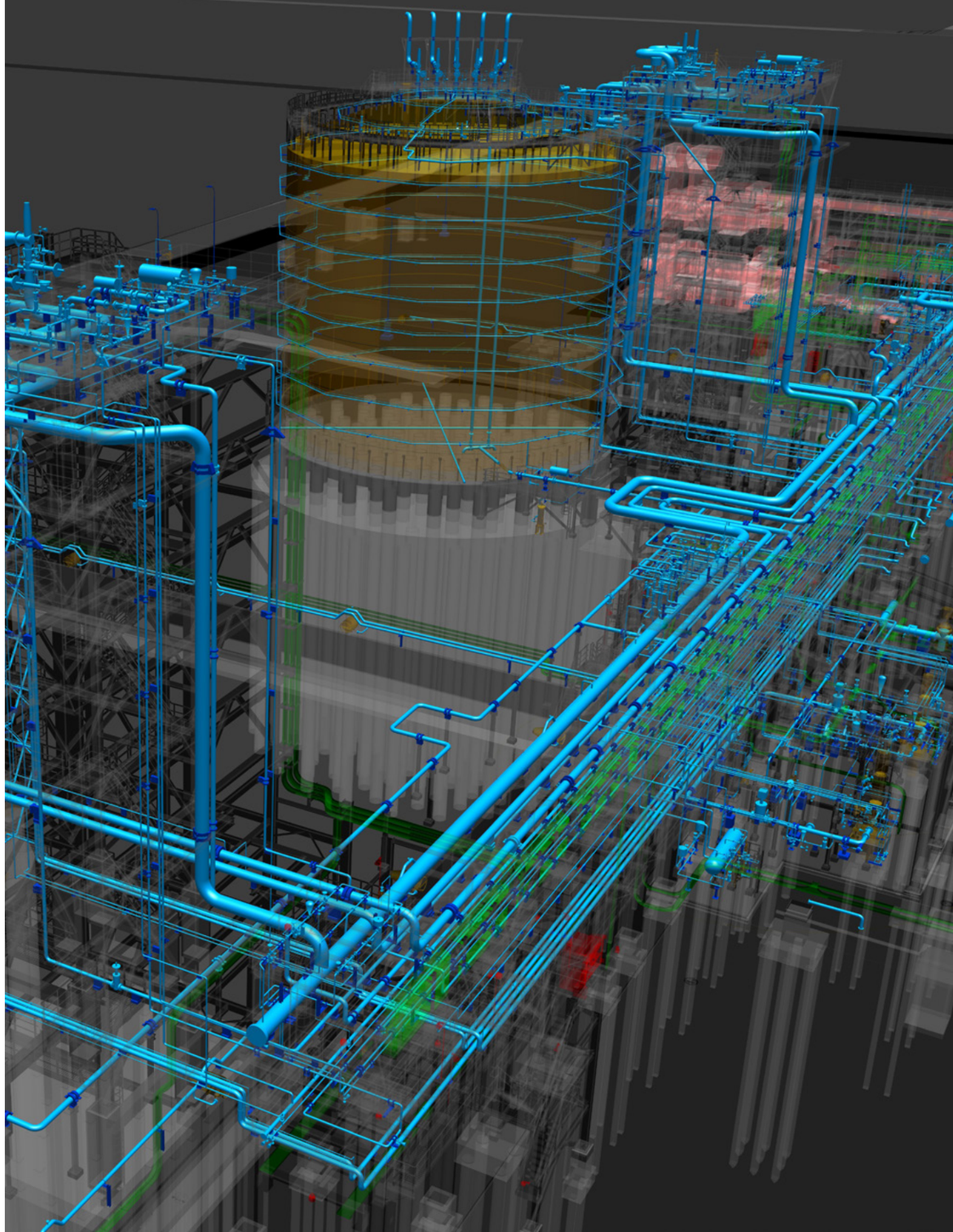
Forte 3DWorx is a powerful and versatile DWG file-based solution that redefines plant design and automation. It provides unmatched flexibility and scalability, delivering an ecosystem that streamlines the entire plant design process.

With its user-friendly approach, the solution is quick to set up, use and is perfect at adapting to the demands of any project, making it an indispensable tool for both small and large-scale designs.

About Forte 3D

Forte 3D is the pinnacle of industrial design solutions, enabling the design of industrial facility mega projects. With its data-first approach, the solution provides all the tools needed to design a facility and maintain the digital representation for a comprehensive digital twin throughout an asset's lifecycle.

With its advanced automation and data management capabilities, Forte 3D excels in handling complex, large-scale designs.



“Digitizing plant information with Octave tools helped us in eliminating human errors and data mismatches through automation and integration. We were able to use the information at the right time and place, with the latest data incorporated. Analyzing plant information was easy and could be done based on the business needs during each step of the project.”

– Ahmed Nabil, Chief Information Officer, PGESCo

3D design that meets your project scope

Forte 3D

Common Base Design Capabilities

Select for projects that include:

- Primary handover format is rich data
- Extensive back-end data integration of supply chain; project execution
- Projects requiring tight user access/permission control at single or multiple sites
- Project has complex splits for division of work not easily managed by multiple files
- Automated change tracking (who; when; why) on system-assisted change management
- SDx integration enables automated data transfer and system-assisted change management from P&ID to 3D
- Extensive MTO requirements; multiple alternative database filters and representations with back-end integration to procurement
- Detailed electrical raceway and equipment modeling; cable assignments to trays; MTO of physical components and cables
- Project requires integration of various graphics/data from multiple sources via translation with SIOP, e.g. MCAD, AVEVA, etc.

Forte 3DWorx

Common Base Design Capabilities

Select for projects that include:

- Managing DWG files as the primary handover format; lots of interaction/integration with Autodesk tools like Revit
- Light integration needs; integration benefit more between modeling and analysis to reduce iterations; less about heavy data sharing across departments
- User access control requirement is simple; accomplished file/folder setup with Windows user Management
- Project has clear vertical splits for division of work; easily managed by individual design files
- Change tracking and management are achievable via visual inspection and notation
- Piping and process integration achieved with simultaneous display of schematic data/model data for visual checking and correction; AutoCAD deliverable loop diagrams
- Simple MTO requirements; few to several database filters and representations
- Simple or detailed electrical raceway and/or HVAC ducting detail electrical involving cable assignments to trays; MTO of electrical and/or HVAC componentry
- “Inside Plant” projects involving high purity piping and interface with Revit architectural models for BIM modeling
- Projects requiring a quick and easy learning curve for AutoCAD-trained workforce

Technology-driven outcomes

Octave's commitment to innovation ensures that organizations have access to cutting-edge technologies that facilitate the creation of high-quality designs. These help align with the latest regulatory standards, thus mitigating risks and enhancing project efficiency.

By leveraging Octave's schematics and 3D modeling solutions, companies can enhance their workflows with tools for fast-paced industrial design, achieving high-level efficiency and precision. These comprehensive software suites are designed to smoothly accommodate both new greenfield and existing brownfield projects, offering a range of capabilities that enhance the design workflow and increase project success. Octave provides these two distinct suites to ensure the best fit for diverse project needs and customer requirements.

This approach underscores Octave's commitment to a customer-centric philosophy, enabling clients to access tailored solutions that match the scale, complexity and specific demands of their projects. Whether optimizing large-scale, complex industrial facilities or providing flexible solutions for smaller, adaptable projects, Octave's design suites empower organizations to achieve their goals with precision and excellence.

Octave's technologies generate actionable insights that lead to better decision-making and improved project outcomes. By embracing these solutions, organizations can achieve preferred contractor status, optimize workforce utilization and provide consistent, high-quality project deliverables. Octave's commitment to innovation and excellence ensures that organizations are equipped to navigate the complexities of industrial design and deliver exceptional results.

"As a solution-agnostic engineering company, we have experience with every software and editor in the market. We see that Octave's solution can deliver transformative results and help our clients design faster and more efficiently and capitalize on integrations across the complete lifecycle. And what I particularly appreciate with Octave is that there is always a way to see eye-to-eye and build something together."

– Stéphane Poirier, Director of Growth and Development, ATS

About Octave

Octave is a leader in enterprise software, turning data into decisive action and intelligence into your edge. Our software solves for and simplifies complexity, from the design and build to operations and protection of people, property, and assets– for any scope, at any scale. For decades, we've partnered with customers to sharpen performance, elevate efficiency, and amplify results. From factory floors to entire cities, our solutions are tuned to scale up what's possible from day one onward.

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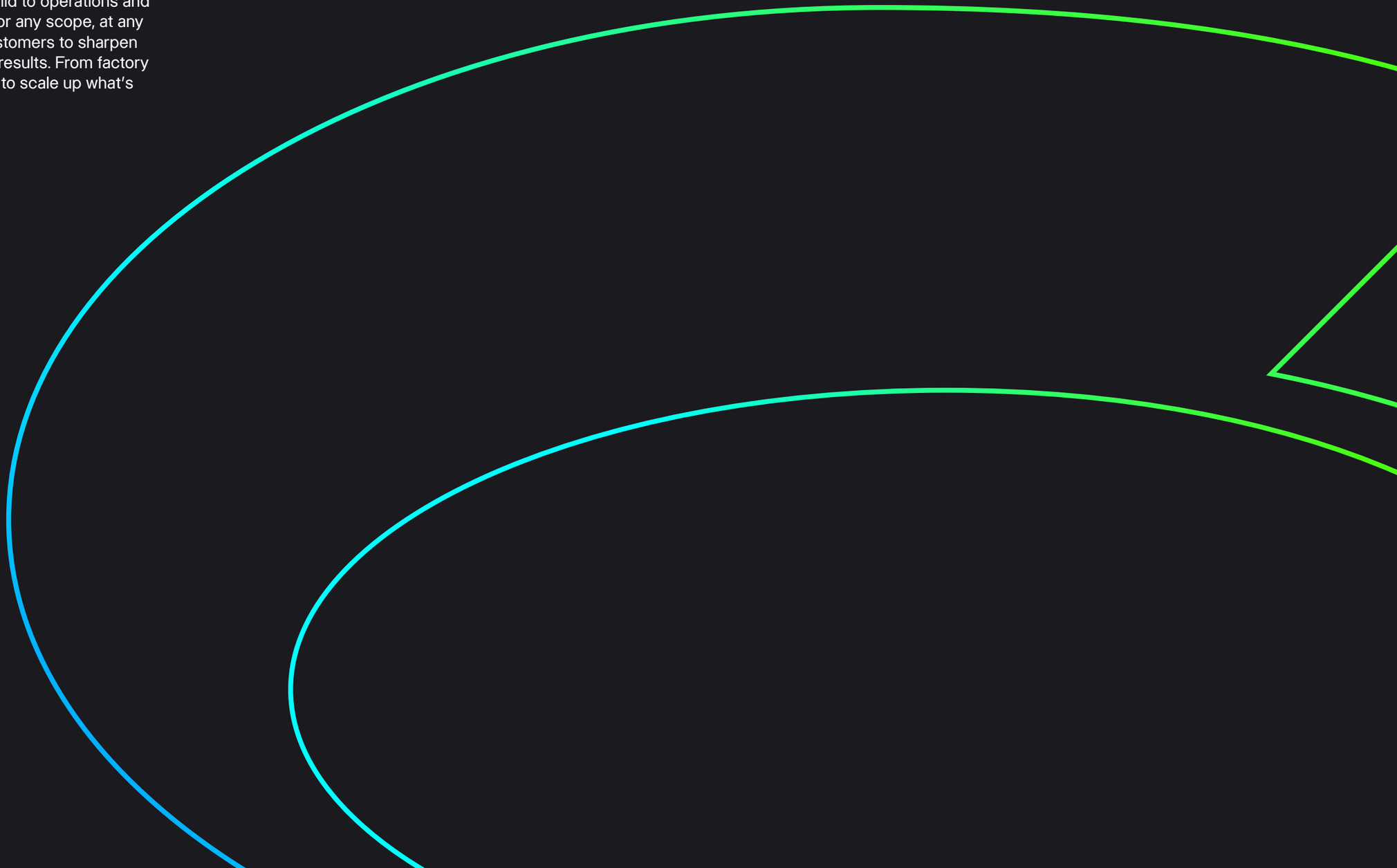

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