



Going beyond the digital twin

EBOOK

Welcome to the next chapter of digital asset intelligence

Author: Tom Goff, Executive Industry Consultant, Octave

Contents

1	Introduction	03
2	Beyond the digital twin	04
3	Managing data and documents	08
4	Smart project execution	11
5	Ongoing operations	15
6	Conclusion	19
7	References	20
8	About the Author	20
9	About Octave	21

Introduction

Data alone is just data. Connect the dots, and possibility expands. In this eBook, we'll introduce the technology driving the next era of digital transformation at leading industrial companies—moving beyond digital twins towards integrated, intelligent systems. To do so, we'll cover the three foundation aspects of digital transformation, including:



01

**Managing data
and documents**



02

**Smart project
execution**



03

**Ongoing
operations**

At every stage of the lifecycle, Octave technology helps companies harness the power of their data, turning information and into intelligence and intelligence into impact.

Smarter decisions. Amplified efficiency. Stronger collaboration. Welcome to the next chapter of operational excellence.

Beyond the digital twin

“Do more with less.” It’s a demand that today’s owners, operators and engineering, procurement and construction (EPC) firms are well accustomed to hearing. From stakeholder pressure and ever-tightening schedules, to increasingly limited budgets and resources—in a landscape this challenging, there’s no room for error.

As a result, many companies have embraced digital twin technology to improve efficiency and operations.

What is a digital twin?

A digital twin is a dynamic digital representation of a physical asset. It’s continuously updated with data to capture and reflect the asset’s real-time status, current and projected performance and value across the lifecycle.

Digital twins provide quick access to accurate, up-to-date information that facilitates smarter decisions and processes, enhances productivity and reduces operational risk. These benefits are significant—but they’re just the start of what today’s latest tech can deliver.



Introducing Smart Digital Reality

Taking productivity to the next level requires going beyond digital twins. That's where Octave Smart Digital Reality comes in.

Smart Digital Reality is a unified, data-driven digital environment that transforms industrial assets management. Powered by **Octave InConcert (formerly HxGN SDx2)**, Smart Digital Reality consolidates and contextualizes data, leveraging automation and analytics to transform projects and assets into intelligent, adaptive entities.

The result? Smarter, stronger, safer operations capable of doing more with way less.

Where digital twins offer a virtual reflection, Smart Digital Reality fuses the physical and digital worlds in real time, enabling companies to leverage data at a global level across lifecycles. From design to decommissioning, Smart Digital Reality unlocks faster decision-making and stronger outcomes at every phase.

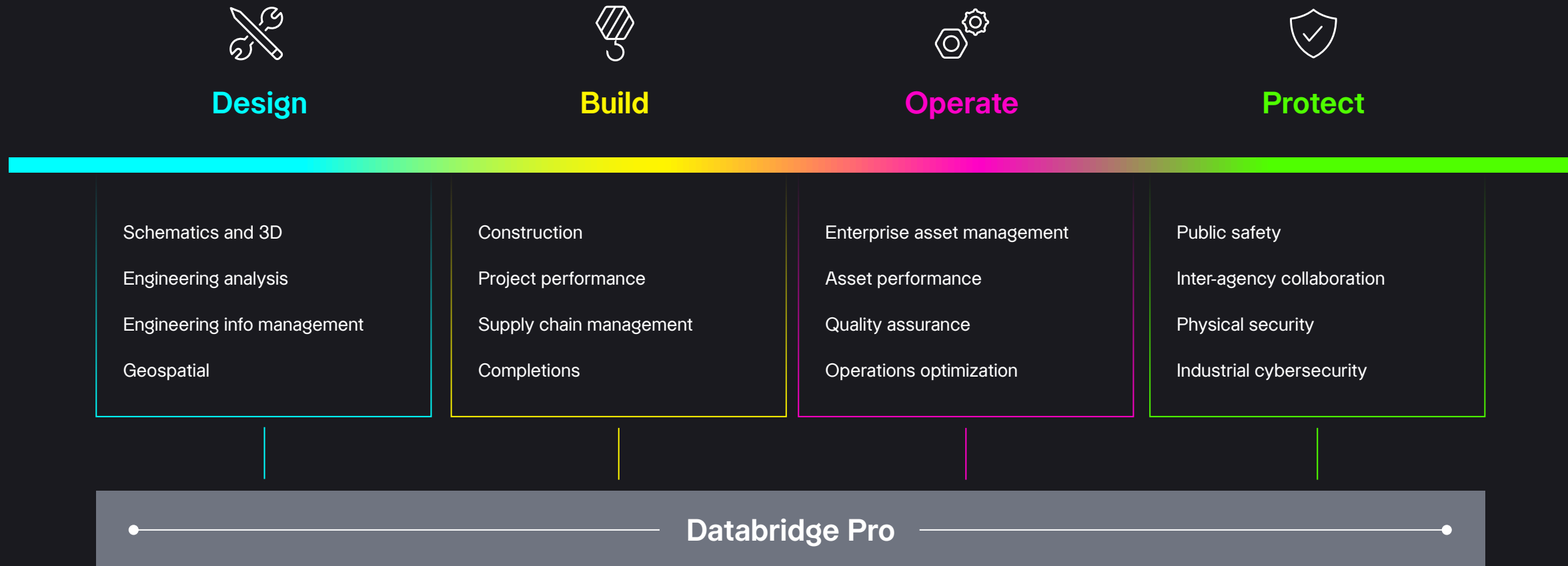
Embedded with intelligence. Built for automation. Designed to expand what's possible. With Smart Digital Reality, a more productive, sustainable and autonomous future is in reach.



Tap into lifecycle intelligence

One platform. One source of truth. Octave solutions unleash the power of intelligence across every phase of the asset lifecycle.

Modular, cloud-based and data-centric, InConcert serves as the digital backbone running through Smart Digital Reality—empowering companies to design, build, operate and maintain critical assets as efficiently and sustainably as possible.



Databridge Pro is Octave's common integration platform that seamlessly moves and transforms data across systems, connecting and enabling workflows end-to-end across the Design, Build, Operate and Protect pillars.

Solutions for any stage

Octave solutions are built to benefit owners, operators and EPCs at any scale and any stage.

From existing facilities with data scattered across legacy systems, to new companies starting fresh with modern tools, to those that are already digitally advanced and just in need of a better way to consolidate and view it all—wherever you are in your digital journey, Octave is here to help.



Managing data and documents

Implementing Smart Digital Reality to manage key asset information (from documents to structured and unstructured data) unlocks a range of benefits.

Structured Data = Data formatted and defined to a set structure

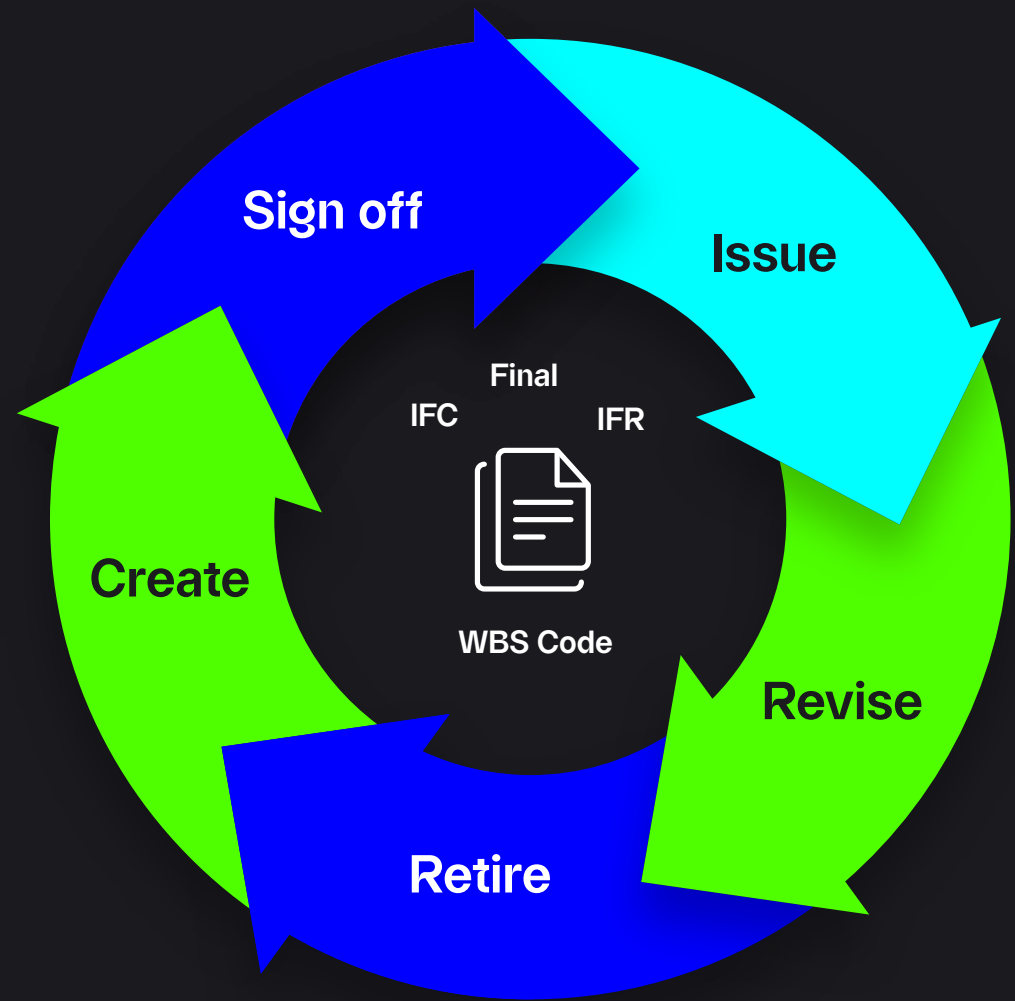
Unstructured Data = Data in whatever native format it was created and not yet processed

The limits of electronic systems





Electronic document management systems manage storage of documents in a secure digital format. However, these systems come with limits:

- Often document-centric, even when digital
- While a few have basic data management capabilities, most are limited to structured data
- Many lack the comprehensive functionality required to leverage advanced digital reality solutions

In contrast, a Smart Digital Reality environment provides expansive document management functionalities, including: document check-in and out, automated revision management, information requests, submittals, transmittals, electronic signatures and and more.



Support the entire lifecycle of the documents

 <p>Edit Check-in/out, revse, sign-off</p>	 <p>PDF Renditions</p>	 <p>View and markup</p>	 <p>Bulk Upload</p>
--	--	---	---

In addition, Smart Digital Reality consolidates all asset information and relationships into a single, user-friendly view. This enables users to quickly search for and locate the right information—reducing time wasted by as much as 47%, according to a Gartner study.

Data management

InConcert automatically creates data relationships based on preset rules. These rules apply beyond the file itself to include content and embedded metadata.

Managing data at this level means it can be updated in real-time, ensuring users can always access the latest version. Additionally, users can view data graphically (e.g., documents, 3D models and laser scans) without native applications. This helps eliminate information silos and provides users with a single source of truth for actionable insights and decision-making.

Automated workflows

A key feature of Smart Digital Reality is its ability to create and configure automated workflows.

Workflows can be customized to send notifications that require approval steps and progress tracking, as well as for other specific needs (e.g., submittals, transmittals, quality assurance/ control, document reviews and work packages).



Smart project execution

After initiation and planning comes project execution: a critical phase where many project elements are set in motion, including frontend engineering design (FEED), detailed design, procurement, construction and commissioning.

During this phase, it's essential for stakeholders to work from a single source of truth, enabling effective collaboration based on accurate, up-to-date asset information.

By consolidating diverse data sources into a unified platform, Smart Digital Reality enables seamless access to information and empowers stakeholders to make smarter decisions, faster. In addition, Smart Digital Reality increases visibility for all parties and automates workflows to maximize project execution efficiency.

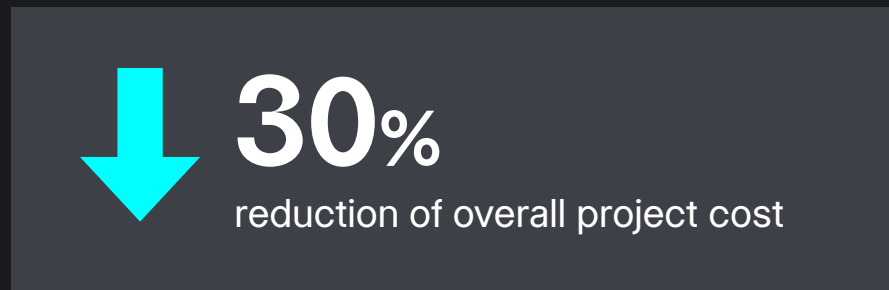


FEED and detailed design

The FEED phase includes conceptual design and feasibility studies to assess costs and technical issues, identify potential risks and produce preliminary design deliverables for bidding contracts. Done right, this phase establishes the project's budget, timeline and scope.

A Blackridge Research study indicates a "FEED study can consume two percent of the project budget" and that "a well-executed FEED can reduce the overall project cost by 30%." ¹

A large volume of data is created during this phase. When integrated into the Smart Digital Reality environment, it becomes an essential part of the asset's digital twin. In today's around-the-clock engineering environments, establishing this level of real-time visibility early on is key. Octave's fully integrated, rule-driven technologies strengthen collaboration, reduce time wasted and eliminate inconsistency from day one.



Procurement and materials management

From material shortages and cost-escalating surpluses, to verifying and managing different suppliers—procurement and materials management is one of the most complex aspects of project execution.

Success depends on integration between lifecycle data and supply chain management solutions. This level of integration enables close collaboration between suppliers, EPCs and partners, increases flexibility and scalability, and reduces added costs due to shortages, surpluses and labor hours.

Real-time visibility across the supply chain is also critical, enabling teams to proactively identify bottlenecks, track statuses and make informed decisions, faster.

Octave's comprehensive suite of products, including **Octave Loop Core** (formerly Intergraph Smart Materials), **OnSite Construction Planning** (formerly Intergraph Smart Construction) and **Loop Material Readiness** (formerly Jovix), proactively tackles these challenges (and more) head on. By connecting materials data, suppliers and workflows end-to-end, Octave amplifies efficiency, improves visibility and protects budgets.

Construction

The construction phase is when assets and facilities come to life. In a perfect world, constructability is thoroughly considered during the design phase. However, this isn't always the case.

On-site issues, construction delays and design changes (expected or unexpected) can drive costly rework, leading to:

- Challenges managing subcontractors
- Inaccurate progress reporting
- On-site material readiness and waste issues

To address these common issues, the industry is has embraced new technologies.

A KPMG study states that "the construction industry is starting to embrace the power of technology to transform performance – with 81% of E&C firms adopting mobile platforms, 43% using robotics process automation (RPA) and 40% adopting artificial intelligence (AI) – although many are in the early stages ... VR has doubled from 28% to 56%." ²

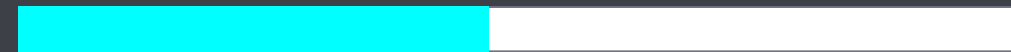
As this shift continues to accelerate, the pressure is on for companies to stay competitive. The solution? Octave's modern work package planning platform, OnSite Construction Planning.

OnSite Construction Planning integrates with Loop Core (or third-party systems) to provide real-time forecasts, statuses, reservations and visualizations of materials. Users can view 3D models and drawings with enhanced 4D animations and mobile capabilities that bring digital work into the field.

Octave's material readiness application Loop Material Readiness takes visibility even further, ensuring all stakeholders know exactly what, when and where materials are located at all times.

43%

using robotics process automation (RPA)



40%

adopting artificial intelligence (AI)





Completions and commissioning

Completions and commissioning is the final phase of a project before client handover, including:

- Defining commissioning systems and tags
- Creating test work packages and inspections
- Managing punch list and non-conformance items
- Providing accurate certification for turnover and startup

For companies bogged down by manual processes and information silos, these tasks can be a major challenge. An integrated digital solution, like OnSite Completions, makes it simpler and more cost-effective.

With OnSite Completions, projects can expect average savings of 45%-50% on resources and time spent during this phase.



Automated workflows

Automated workflows change the game throughout every project execution phase—increasing efficiency, productivity and outcomes across the board.

Automated workflows help:

- Standardize and streamline tasks
- Eliminate guesswork with real-time tracking and overdue notifications
- Provide clear visibility into bottlenecks—before work slows down

Smart Digital Reality empowers users to create and configure automated workflows with parallel or sequential steps, enabling streamlined collaboration amongst internal and external stakeholders.

Ongoing operations

If you don't have the data, you can't put it to work. That's why it's essential for owners and operators to set clear data handover requirements with contractors on day one.

Establishing requirements early ensures owners and operators obtain all the information they need to efficiently operate and maintain facilities throughout the project. And it's how leading companies get the most out of their digital investments.

Smart Digital Reality streamlines the handover process by reducing manual tasks in favor of automation and real-time updates. As handover costs often amount to as much as 10% of total project costs, these automation-driven savings can be significant.



A unified source of truth

According to a study by McKinsey & Company, "users can spend between 30% to 40% of their time searching for data if a clear inventory of available data is not available, and they can devote 20% to 30% of their time to data cleansing if robust data controls are not in place." ³

With Octave, that amount of time wasted is a thing of the past.

No more digging through paper documents, disconnected systems and isolated databases. Smart Digital Reality pulls data from varied sources (including engineering, reality capture, IIoT, sensors, operations and more) into a unified digital environment that makes it easy to locate the right information.

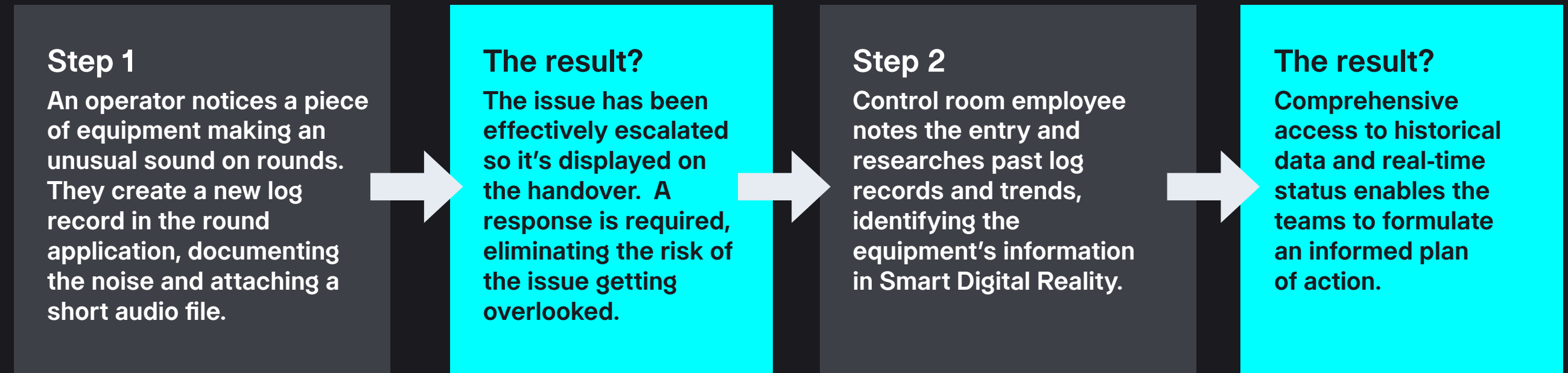
Boosting efficiency and security alike, Smart Digital Reality offers access to contextualized information tailored to user roles. With instant access to clear, relevant and up-to-date data, users can make smarter decisions, faster, on-site and off. Reducing the time needed to locate and validate information frees employees to focus on more critical tasks.



Integrations

Within the Octave technologies that form Smart Digital Reality are integration capabilities facilitated through web APIs and extensibility.

These capabilities allow user access to up-to-date, contextualized information from different systems (e.g., operational, maintenance, knowledge management) when and where they need it.



With seamless collaborations and information exchanged across different systems, Smart Digital Reality enhances efficiency and improves the overall responsiveness of operational and maintenance teams.

Ongoing capital projects and turnarounds

Access to accurate asset data is critical to every project phase, from initial operations to ongoing capital projects, turnarounds and unforeseen events. In these scenarios, integrated project delivery is key to aligning objectives, interests and practices.

Smart Digital Reality provides the level of collaboration and transparency these situations demand, providing a centralized platform where stakeholders can access all the asset information they need. With the same key information available at everyone's fingertips, teams can coordinate more seamlessly, make smarter decisions, improve resource allocation and react faster to changes and challenges.



Decommissioning

While less frequently discussed than other project phases, decommissioning is mission-critical—especially in highly-regulated industries like nuclear energy, pharmaceuticals, chemicals and food and beverage. It involves the safe disposal and management of assets, including potentially contaminated materials and equipment that may pose environmental risks.

With so much at stake, access to accurate, readily available asset information is essential for:

- Regulatory compliance
- Safety
- Efficient planning
- Cost management
- Environmental impact
- Legacy documentation

Smart Digital Reality technologies can significantly improve decommissioning efficiency by centralizing asset data into a single, comprehensive view of the facility. This makes it easier to identify, track and manage materials and equipment throughout the process.

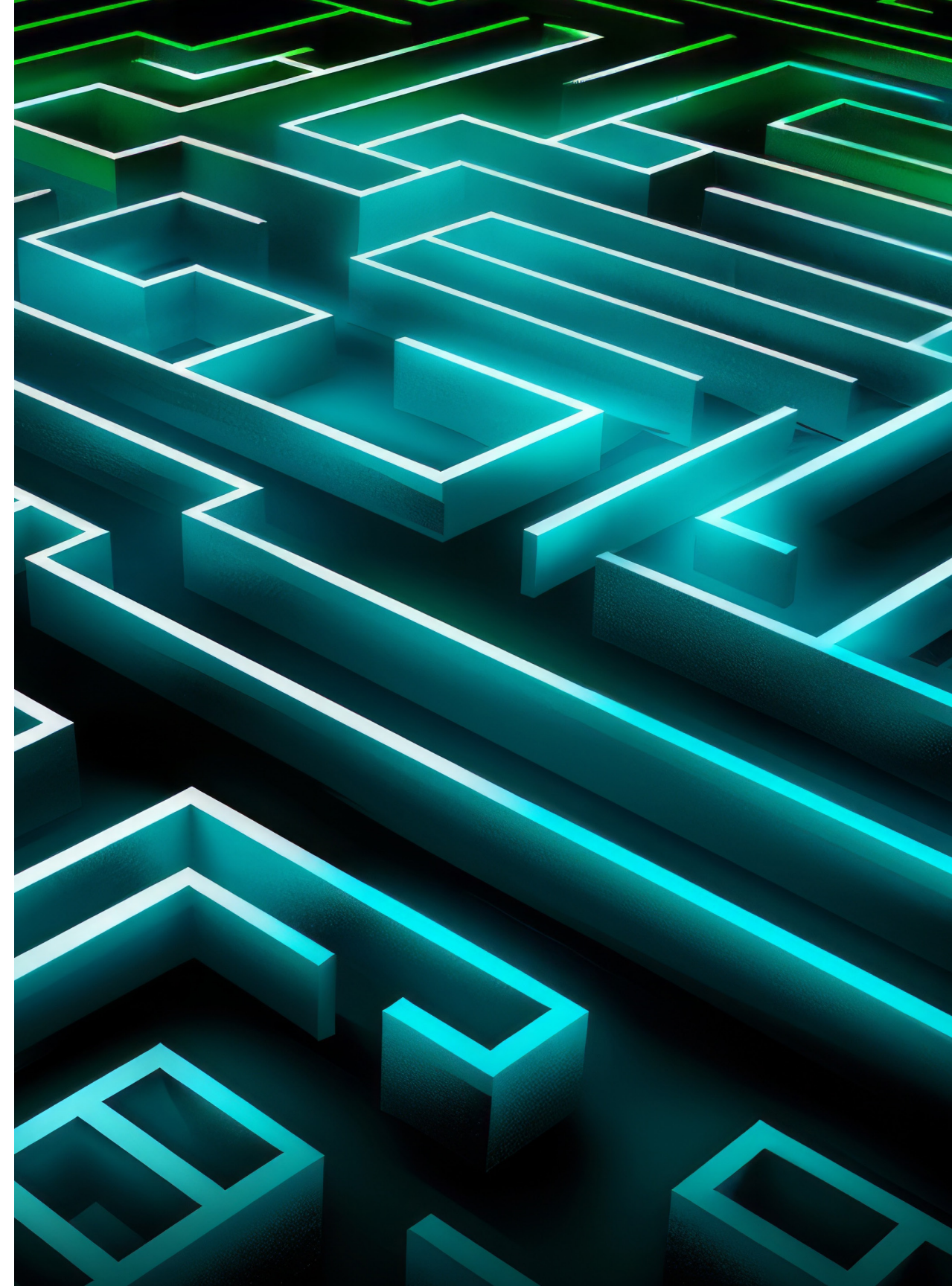
Conclusion

One source of truth. Endless opportunities.

Smart Digital Reality unleashes a powerful digital environment that consolidates and contextualizes data, leveraging automation and analytics to transform industrial projects and operational assets into intelligent, autonomous entities. This evolution is a significant step toward safer and more efficient, profitable and sustainable industrial operations.

Ready to take the next step toward digital transformation? Octave is here to help.

For more, explore [the blog series that inspired the eBook](#).



References

¹[FEED - Front End Engineering Design | Meaning & Definition](#)

²[Familiar challenges - new approaches: 2023 Global Construction Survey](#)

³["Reducing Data Costs Without Jeopardizing Growth." McKinsey Digital, July 2020](#)

About the author

Tom Goff, a executive industry consultant with Octave, boasts more than 30 years of experience across multiple industries (i.e., oil and gas, chemical, nuclear) in EPC and information management and has led many operational excellence initiatives. He leads consulting initiatives with Octave customers throughout their digital transformation journey. Tom has a bachelor's degree and MBA from Capella University, is certified PMP and LSS Black Belt and is a U.S. Army veteran.

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.

©2026 Octave Intelligence plc and/or affiliates. All rights reserved.

