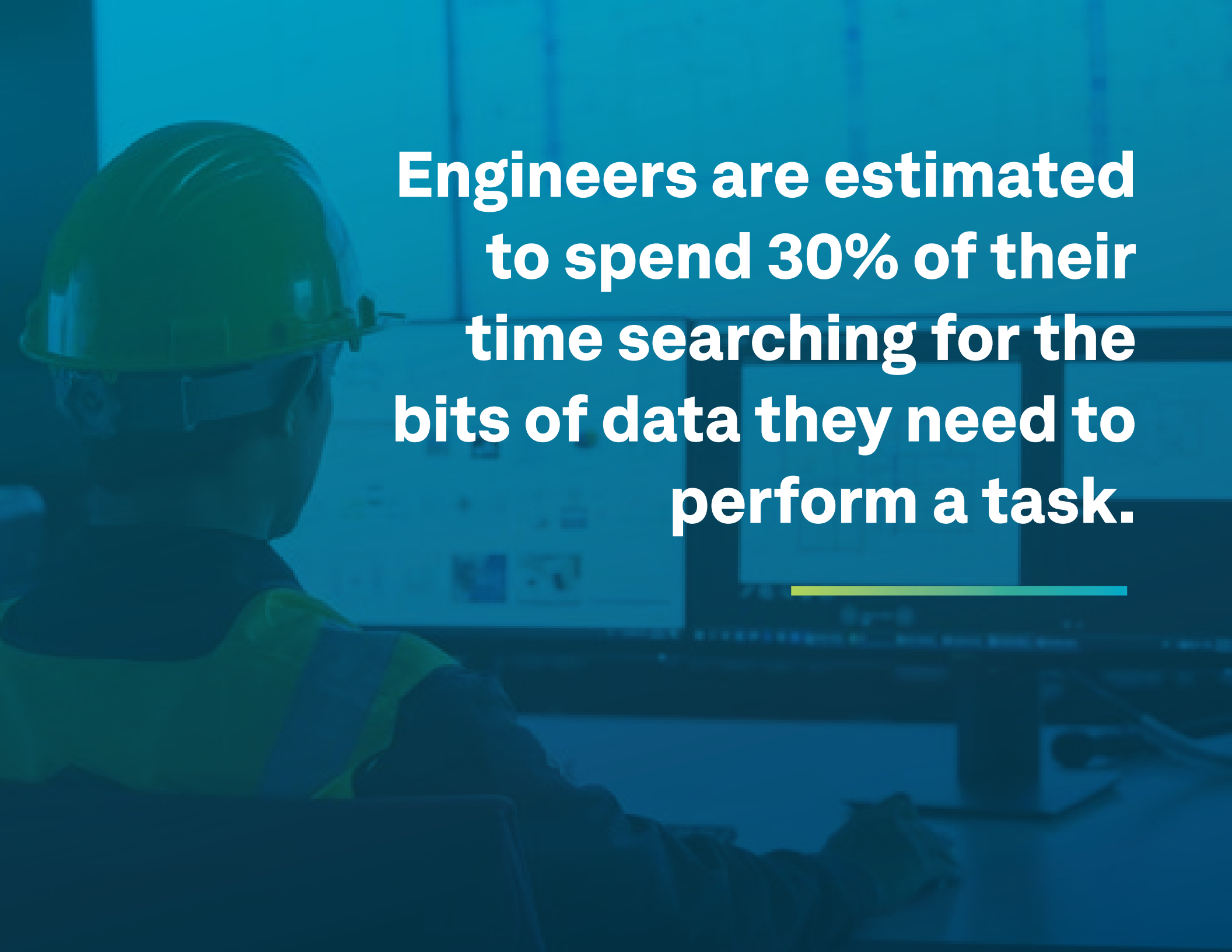
HEXAGON

ebook

Creating Your Smart Digital Reality™ for More Autonomous and Sustainable Industrial Facilities



Engineers are estimated to spend 30% of their time searching for the bits of data they need to perform a task.

The Industrial Data Challenge

Data is ubiquitous. Continuous improvements in sensors, microprocessors and other technologies have accelerated the Industrial Internet of Things (IIoT), with more instrumentation, automation, and mobile devices generating ever-increasing volumes of data within industrial environments.

Making smarter and faster decisions to improve the design, execution, and operation of an industrial facility can only go so far, however, without vastly improving how data is managed across the entire industrial project and asset lifecycle.

In most facilities today, each system generates a wealth of data that is often presented to a limited audience for a specific purpose within a particular process in the lifecycle. But that data is often disconnected from other systems and processes, so it lacks the necessary context to be useful in driving smarter and faster decisions.

Data is siloed within software systems, organizational groups, or bound to stacks of paper, creating a nightmare for engineers and other industrial workers who are estimated to spend 30% of their time searching for data they need to perform their jobs.

That's a significant amount of time spent on low-value work. What is needed is a better way to manage data as vital, real-time information that delivers tangible benefits across the industrial asset lifecycle — including improved collaboration and smarter decision-making that increases the productivity, operational integrity, and sustainability of industrial facilities.

Your Smart Digital Reality

Converting Data to Information

The process of converting data to information is where value to the organization is realized. Analyzing, contextualizing, visualizing, and combining data transforms it into actionable information.

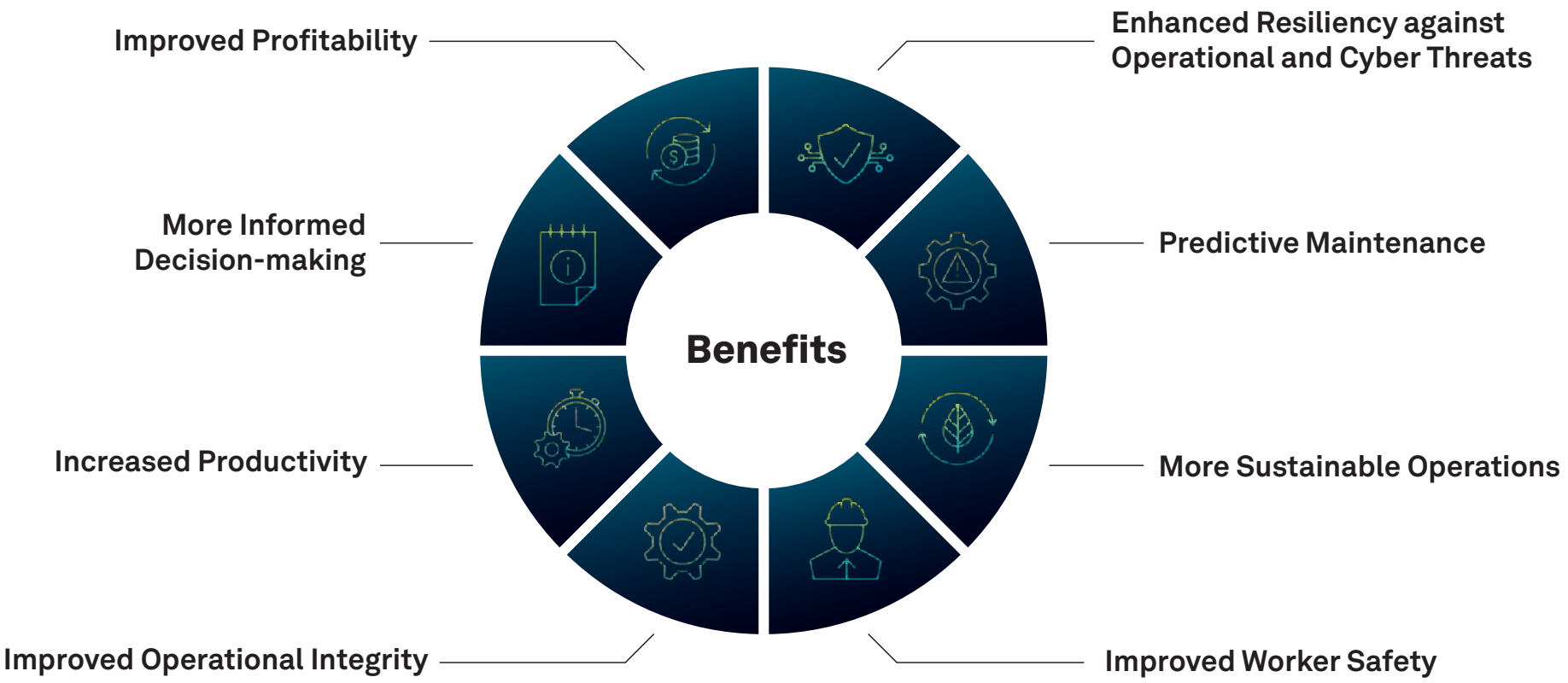
Hexagon enables all of this to happen within a unified, role-based, and real-time view of both the physical and digital realities across your industrial projects and assets portfolio — what we call your Smart Digital Reality™.

This single pane of glass view into your unique industrial asset lifecycle connects disparate datasets across different work processes, with data governance of all your engineering and operational information integrated and contextualized across the lifecycle and within the appropriate work procedures and regulatory requirements.

Because Hexagon infuses the Smart Digital Reality with intelligence to automate processes and analytics, it is much more than a virtual representation of a physical asset like a digital twin — it increasingly removes human intervention, errors and risks on the journey to a fully autonomous future.

Your Smart Digital Reality offers a holistic view of your industrial facilities, providing a comprehensive look into the status and performance of projects and assets, including challenges and areas of opportunity to make them more efficient, profitable, safe and sustainable.

By contextualizing, visualizing and then facilitating work process enhancements across the lifecycle, your Smart Digital Reality enables you to manage your industrial portfolio as more intelligent and autonomous “Digital Projects” and “Digital Assets.”



Your Smart Digital Reality

The Key to Sustainable Industrial Development

Whether you're breaking ground for new facility construction or managing an existing operation, data is captured and processed via our proprietary Digital Backbone. Context is added by linking 1D documents and 2D schematics over 3D models or point-cloud laser scans, regardless of the data source.

The result enhances the execution of work processes that run natively within this highly intuitive environment and allows personnel who review the information to generate new insights in support of faster, more accurate decisions and actions that lead to improvements in safety, quality, efficiency, and productivity — all of which contribute to economic and environmental sustainability.

The Digital Backbone

How Hexagon Fuels Your Smart Digital Reality

Because your Smart Digital Reality is only as good as the data that fuels it, Hexagon has built a Digital Backbone that provides the infrastructure and services needed to facilitate data consolidation and interoperability and to ensure all data sources are captured and applied within the context of your Digital Projects and Digital Assets work processes.

Streamlining and centralizing the entire data inventory enables users to achieve more and make better-informed and more immediate decisions, not just with Hexagon solutions, but with legacy systems and third-party software and digital twins.

Hexagon's Digital Backbone connects all phases of the industrial asset lifecycle, from project planning, design and execution, to operating, maintaining and securing assets. It delivers cutting-edge capabilities in autonomy, analytics, visualization, artificial intelligence, industrial IoT/sensors and robotics, with new features and services updated regularly to accelerate digital transformation — adding more value to your Smart Digital Reality over time.

The Digital Backbone

Connecting Digital Projects and Assets

Hexagon's Digital Backbone helps to create and maintain your Smart Digital Reality by automating the handover, tagging, and back-modeling of new and existing assets, turning data into insights, and connecting the Digital Project and Asset worlds using integrated solutions within the Digital Backbone.

This will vastly reduce the time, cost and complexity of creating and maintaining Smart Digital Realities for industrial facilities.

To maintain the Smart Digital Reality, feedback loops are implemented between Digital Projects and Digital Assets through the Digital Backbone. In this feedback loop, the constant changes to operating parameters and process improvements within the facility are captured and fed back in to ensure your Smart Digital Reality is always up to date.

The information presented in the Smart Digital Reality is always evergreen, available on-demand, on any device, and always insightful — helping organizations to readily capture the value of their digital transformation efforts.

Our research, for example, indicates organizations can reduce cost overruns by 20%, improve maintenance efficiency by 10% and operational efficiency by 30%. In addition, Hexagon solutions have been shown to reduce inventory and documentation efforts by more than 70%.

Regardless of where a facility is in the asset lifecycle, the Digital Backbone provides an easy way to leverage intelligent technologies to digitize key work processes and accelerate an organization's path to a more autonomous and sustainable future in industrial development.

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Your Smart Digital Reality Journey

With the Digital Backbone providing new levels of interoperability, intelligence, and innovation, you can choose where and how to leverage those benefits within your Smart Digital Reality to address your specific business and technology priorities — driving digital your way to address your unique challenges.

Smart Digital Reality

Digital Projects						Digital Assets					
Plan	Design		Execute			Operate		Maintain			Secure
Portfolio & Project Planning	Conceptual Design	Detailed Engineering	Supply Chain	Fabrication	Construction	Operations Management	Environment, Health & Safety RIsk	Maintenance Management	Asset Integrity & Reliability	Sustaining Engineering	OT/ICS Cybersecurity

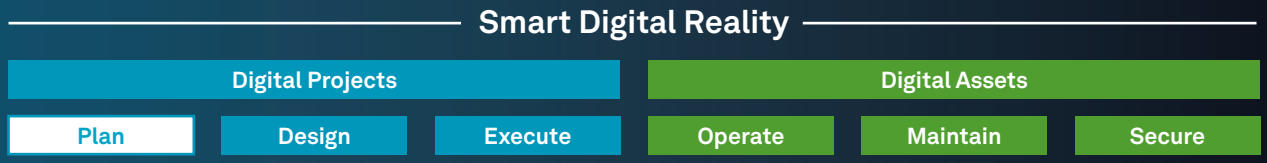
Digital Backbone

Interoperability Connectors	Common Data Environment	Reality Capture	Digitization	Visualization	Analytics

Your Smart Digital Reality

Plan

Portfolio and Project Planning is key to the assessment, selection and delivery of projects that are aligned with your organizational goals and objectives. With an integrated enterprise project performance solution, projects are consistently aligned with your strategy and provided a holistic view for immediate identification of issues and the means to determine and communicate course-correcting changes. Portfolio and Project Planning also allows project teams to produce accurate and timely forecasts in vital functions such as resource management, risk management and change management.



Key Benefits

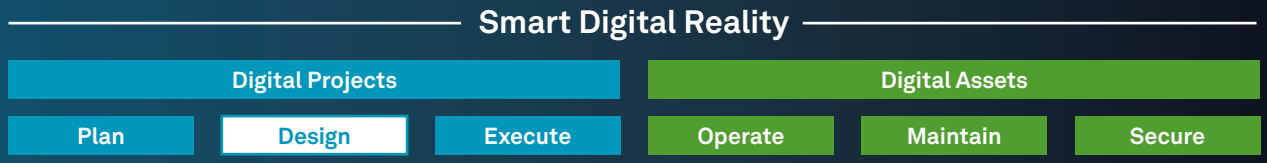
- Ensure capital and human resources are available and optimized across the enterprise
- Seamlessly integrate data across portfolios, projects, assets and disciplines to optimize project selection, design, resourcing and profitability
- Accurately define scope, budget and schedule for project and event design and execution

Your Smart Digital Reality

Design

Conceptual Design is an essential component for efficient and intelligent plant engineering, playing an early crucial role in a plant operating smoothly over its lifecycle. Therefore, it's imperative for engineers to have dependable, accurate estimation through iterative simulation and design optimization as well as optimized simulation against physical layout constraints for maximum project cost-benefit. In addition, you can leverage use case management to facilitate P&ID productivity for Front-End Engineering & Design (FEED) projects.

Detailed Engineering is fundamental for building a "better plant" and essential to manufacturing and industrial operations as they strive to meet higher production goals and stricter regulatory requirements. Hexagon provides an integrated portfolio of 3D Design & Visualization and CADWorx & Analysis Solutions to enable faster, silo-free plant design and engineering, better collaboration and reduced time to execute and operate.



Key Benefits

- Leverage planning data from diverse sources to streamline design and engineering for more intelligent and consistent plans and models
- Generate clear conceptual designs to increase efficiency and accuracy during detailed design and engineering
- Dramatically enhance flexibility, interoperability and collaboration to maximize design accuracy
- Improve the quality and safety of engineering with interoperability between planning, design and analysis

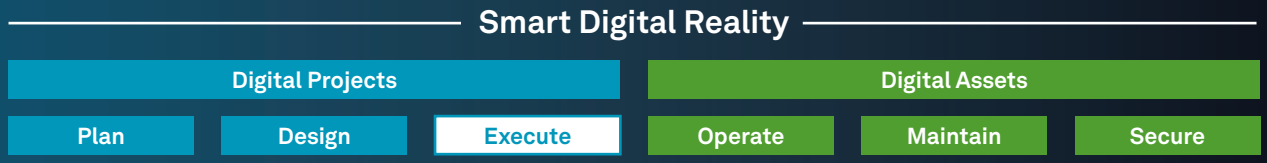
Your Smart Digital Reality

Execute

Supply Chain management is vital for organizing and controlling the activities that ensure continuity and efficiency when constructing industrial facilities. Hexagon solutions such as EcoSys with Smart® Materials, and Jovix®, an award-winning Material Readiness® application, provide the data intelligence needed to ensure supply procurement is precise and cost-efficient, while also enabling end-to-end collaboration and project workbench for all supply chain partners to compress schedules and mitigate risks. With Hexagon, you can automate end-to-end materials management, improve vendor qualification, reduce bid review timelines and more.

Fabrication solutions from Hexagon help owner operators and EPCs save valuable production time during industrial facility construction. Designed to drive efficiency, Hexagon's solutions for plant project management can help avoid costly material surpluses and shortages, while reducing overall project risk.

Construction solutions from Hexagon such as Smart Production provide intelligent integration with engineering and design solutions that can lead to a significant reduction in construction delays, costs, and other risks. Hexagon solutions enable consistent and automatic management of changes, smart backward and forward scheduling functionality, and improved resource utilization during project execution. With Hexagon, you can also drive new levels of productivity and efficiency through improved coordination, planning and collaboration across all construction personnel and contractors.



Key Benefits

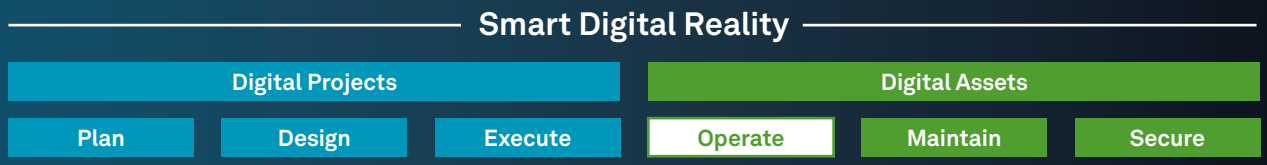
- Leverage the Digital Backbone and design data to efficiently procure, fabricate, construct and commission projects, improving execution time, quality, productivity and cost
- Reduce project rework and waste by better estimating, forecasting, collaborating and tracking of materials and costs
- Minimize risks associated with design and field changes, schedule or delivery delays, worker safety and more

Your Smart Digital Reality

Operate

Operations Management allows for asset data to span across internal and external stakeholders for improved collaboration, productivity and operational excellence, creating a unified view of all operational data and situational awareness for more informed, real-time decision-making from the connected worker in the field to head-quarters c-suite.

Environment, Health & Safety Risk concerns allow for Corporate HSE standards and practices to be defined, implemented and driven daily through plant management while complying with local, state and federal rules and regulations. Increase overall personnel safety, reduce risk and deliver required and applicable training as required to all personnel.



Key Benefits

- Leverage detailed engineering and intelligent design data to accelerate asset handover and operations readiness
- Share asset data across departments and stakeholders to improve collaboration, productivity, and operational excellence
- Create a unified view of all operational data for more informed, real-time decision-making

Your Smart Digital Reality

Maintain

Maintenance Management is at the cornerstone of industrial asset performance and profitability, unlocking new levels of operational excellence and productivity, while also improving budget optimization, resource allocation, worker safety and regulatory compliance. Hexagon solutions enable you to shift from a reactive maintenance approach to a more predictive methodology to improve asset performance and extend the asset lifecycle. Fully integrated across the asset lifecycle, Hexagon solutions also improve visibility of historic, current and planned maintenance tasks to enable improved decision-making and optimization of ongoing maintenance activities.

Asset Integrity and Reliability involves the identification, review, assessment and resolution of deficiencies throughout an asset's lifecycle. Hexagon solutions enable management of all the technical tasks of engineering, logistics investigations and analyses to ensure continued operation and maintenance of a system within pre-identified risk parameters. This real-time asset data is used to monitor and understand asset performance, deliver integrity and reliability, while managing process safety hazards.

Sustaining Engineering is vital for incorporating critical components of early stage project data with later stage maintenance and operations data to ensure integrity across the full asset lifecycle. Hexagon digital solutions utilize AI, Machine Learning and advanced analytics to connect critical data sources across multiple platforms and establish uniform KPIs to improve your industrial facilities' maintenance efficiency, asset reliability and sustainability, production quality and regulatory compliance.

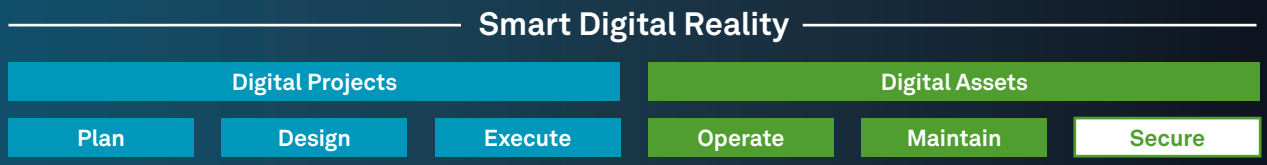
Key Benefits

- Move from reactive to predictive maintenance to improve asset performance, productivity and profitability
- Improve maintenance process efficiency, standardization and human safety
- Reduce waste by improving asset energy usage and extending asset life

Your Smart Digital Reality

Secure

OT/ICS Cybersecurity is vital for mitigating risk, addressing compliance requirements and improving process safety, but many companies are still grounded in IT-centric cybersecurity solutions that address only 20% of OT/ICS-centric cyber assets, leaving proprietary, heterogeneous industrial control systems hidden and vulnerable. Hexagon's PAS Cyber Integrity® solution is an OT/ICS risk and endpoint management solution that provides automation engineers and OT cybersecurity personnel with the critical data and insight needed to make their industrial operations safer and more resilient.



Key Benefits

- Improve operational integrity by automatically capturing inventory and critical data of OT/ICS assets to minimize the impact of cyber and process safety risks
- Optimize vulnerability management through visual representation and risk scoring of endpoints
- Ensure automation works reliably by monitoring complex data from autonomous systems to identify configuration or performance issues

Your Smart Digital Reality

Where to Start

We know digital transformation is challenging. And we know every digital journey is unique based on each organization's business and technology priorities, as well as their digital maturity level.

That's why Hexagon delivers digital your way, with solutions that can be adopted across the entire Project and Asset lifecycle or integrated as point solutions that work with your legacy or third-party systems. And they all work with your Smart Digital Reality — so the decision on where to start is truly yours. We know one size does not fit all.

Your Smart Digital Reality, built on seamless interoperability across all your systems of record, will drive the improvements you need in your critical business processes. We invite you to explore in more depth what your Smart Digital Reality can do for your industrial facilities.

About Hexagon

Hexagon is a global leader in digital reality solutions, combining sensor, software and autonomous technologies. We are putting data to work to boost efficiency, productivity, quality and safety across industrial, manufacturing, infrastructure, public sector, and mobility applications.

Our technologies are shaping production and people-related ecosystems to become increasingly connected and autonomous – ensuring a scalable, sustainable future.

Hexagon's Asset Lifecycle Intelligence division helps clients design, construct, and operate more profitable, safe, and sustainable industrial facilities. We empower customers to unlock data, accelerate industrial project modernization and digital maturity, increase productivity, and move the sustainability needle.

Our technologies help produce actionable insights that enable better decision-making and intelligence across the asset lifecycle of industrial projects, leading to improvements in safety, quality, efficiency, and productivity, which contribute to Economic and Environmental Sustainability.

Hexagon (Nasdaq Stockholm: HEXA B) has approximately 24,000 employees in 50 countries and net sales of approximately 5.5bn USD. Learn more at hexagon.com and follow us @HexagonAB.