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The Industrial Work Surface: Driving efficiency in heavy-asset industries

Contents

Introduction

Professionals in heavy-asset industries such as energy, utilities, renewables, and chemicals navigate a highly competitive landscape and encounter a range of challenges, from unpredictable geopolitical shifts to ever-changing regulations.

Far from being minor issues, business drivers like digitalisation, sustainability, and electrification serve as catalysts for transformative change.

Kongsberg Digital uses advanced technologies, including digital twins, AI and simulation to help companies tackle major challenges across key industrial sectors.

Section 01

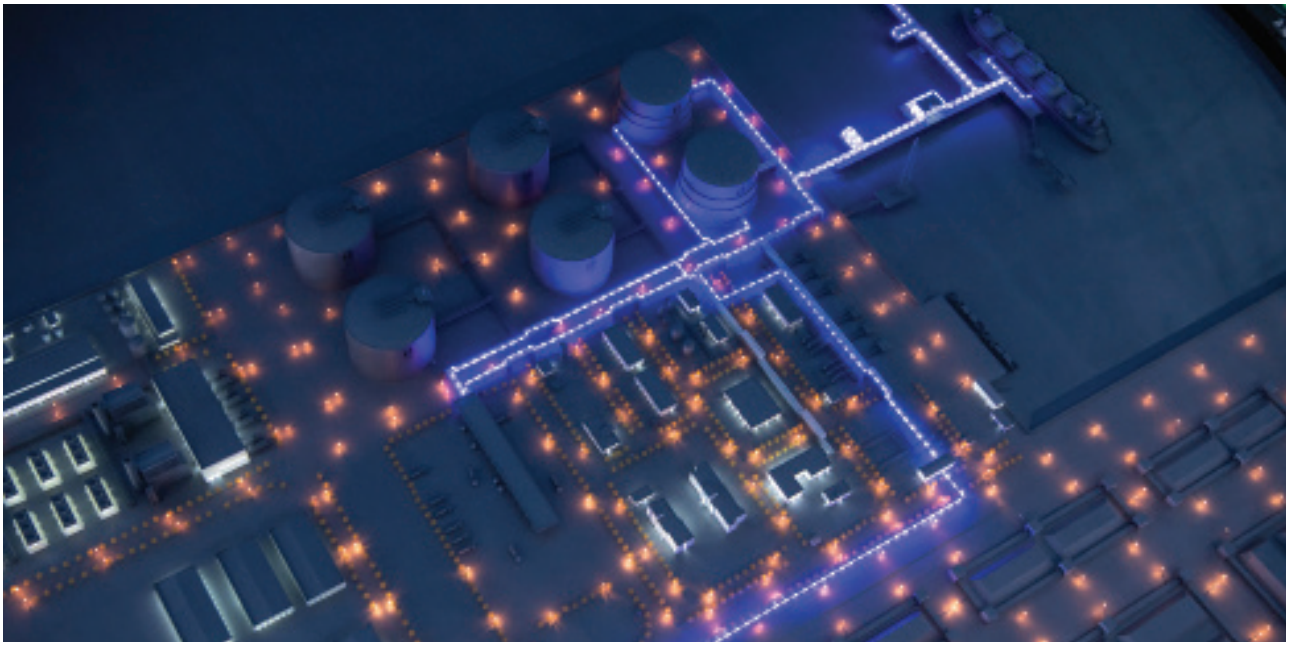
Industrial Work Surface

Shaping the future of work in heavy-asset industries

Leaders at heavy asset organisations want to optimise their current operations and better position themselves for the future, but they need help to improve.

Problem-solving and decision-making can be too slow, ineffective, and resource-intensive. Often, there isn't a single source of the truth that key stakeholders can access across different parts of an organisation. Also, when apps are not connected and data isn't centralised, data doesn't yet have enough quality to yield useful insights. In addition, too many apps, systems, and processes need to be connected and, in many cases, updated.

Kongsberg Digital's Industrial Work Surface provides robust and proven solutions to address the challenges of today's fragmented technology landscape.



Say hello to the Industrial Work Surface

The Industrial Work Surface provides a robust platform for innovation that enables industrial organisations to fully exploit the potential of digital twin technology. It offers advanced sophistication and integration options, enabling organisations to streamline their workflows without having to switch between isolated systems.

The Industrial Work Surface enables users to plan, manage, collaborate on, and execute their end-to-end workflows through a single interface. Its capabilities typically result in significant improvements in operational efficiency and data visibility.

Drive more successful digitalisation

With the Industrial Work Surface and deep expertise from Kongsberg Digital, companies in heavy-asset sectors can increase their productivity and long-term growth.

Connect key data, applications, and processes

Users can generate valuable insights and streamline workflows for every part of the value chain.

Unlock better insights

The Industrial Work Surface enables your experts to generate insights that drive innovation and enhance efficiency.

Enable better, faster decision-making

Create a unified source of truth for all stakeholders to allow for faster business decision-making at scale.

The solution in action

Refine operational efficiency with advanced twin technology

LNG Canada is a major liquified natural gas (LNG) export terminal project currently under construction in Kitimat, British Columbia. The company needed a solution that focused on smart work execution. Its remote location, expensive operations, and travel costs to and from the area required a new approach.

Leadership decided to equip both on-site and remote workers with digital twin technology in the Industrial Work Surface, providing a unified virtual interface for planning, managing, and executing daily workflows. LNG Canada's remote maintenance planners can support on-site teams from any location worldwide. They utilise the digital twin to streamline and expedite work package preparation,access live plant data, and facilitate real-time collaboration with execution teams on-site.

> "As a remote planner, it would be difficult for me to visualise what the plant looks like. There are also activities taking place on-site that we are not aware of. But with the digital twin, we have access to view all ongoing maintenance activities and information related to their corresponding parameters."
>
> Stephanie Marasigan,
> LNG Canada

Reimagining work in heavy asset industries through innovation

Key stakeholders in heavy-asset industries face challenges such as disconnected systems, siloed operations, and slow decision-making, which hinder efficiency, collaboration, and sustainability.

The Industrial Work Surface addresses these issues by unifying data, applications, and workflows into a single platform. This unified platform supports faster, more informed decisions, enhances operations, and drives significant productivity improvements throughout the value chain.

Section 02

Kognitwin®

Maximise uptime, minimise risk and drive operational excellence

Leaders in the heavy-asset sectors encounter significant challenges related to safety, efficiency, and complexity on a daily basis. Disconnected systems and departments result in fragmented data and poor collaboration, which can delay critical decisions. Unexpected equipment failures or inefficiencies can result in costly downtime and decreased productivity.

Scaling sustainable energy solutions like carbon capture, hydrogen, and offshore wind requires accurate, contextualised data for planning and execution.

Kognitwin enables you to access, analyse, and act on your industrial data in a unified virtual environment across all disciplines.

Strengthen productivity through better engagement

Imagine a digital twin of an asset – like an oil platform or chemical plant– where you can get a holistic overview of your operations and manage workflows 24/7 from one work surface. Kognitwin is a digital industrial platform that provides unparalleled access to assets through advanced digital twin technology, seamlessly integrated with AI and simulation capabilities. Users can plan, manage, collaborate, and execute their end-to-end workflows more effectively, all from one centralised interface.

Get a holistic overview of a facility and its operations

Kognitwin facilitates a virtual environment where your industrial data can be accessed, analysed, and actioned across all disciplines.

Ensure safer, more cost-efficient, and sustainable operations

Energy companies use Kognitwin daily to enable better decision-making, maximise business performance, and drive value across the organisation.

Break down silos and democratise data

Kognitwin helps break down both project and operational silos — and provides a single source of the truth for key stakeholders across business units.

Streamline your work in one environment

Kognitwin facilitates an integrated space for one or multiple assets that enables stakeholders to monitor performance, plan activities, drive insights, optimise facilities, and help ensure safe operations.

Enable data-driven decision-making at scale

Reduce R&D costs by applying hybrid machine learning capabilities to run real-time, what-if and look-ahead simulations, virtual metering, and hybrid analytics.

Accelerate and scale decarbonisation efforts

Leverage digital twin technology to contextualise sustainable energy assets, including oil, gas, hydrogen, carbon capture and storage (CCS), offshore wind, and electrification.

The solution in action

Plan and execute complex work faster and more effectively

Norske Shell (Shell Norway) wanted to optimise production, operate sustainably, and keep its workers safe. However, the consequences of an unexpected issue that leads to downtime can be expensive — and even catastrophic.

By recognising the value of data, embracing digitalisation, and using digital twin technology, Shell has positioned themselves as a leader in a very competitive sector.

Kognitwin – also known as "The Twin" – now enables Shell Norway to spot potential failures before they occur, maximise uptime through more effective isolation plans, predict energy consumption more accurately, and more.

Turning data into action for a safer, smarter future

Today's energy leaders face a high-stakes balancing act—maximising productivity while minimising downtime in an increasingly complex landscape. Fragmented data, operational silos, and unexpected downtime make it harder than ever to stay ahead.

At the core of the Industrial Work Surface, digital twin technology provides a single source of truth, breaking down barriers, enhancing collaboration, and enabling faster data-driven decision-making with confidence.

By optimising efficiency, maximising uptime and accelerating progress towards sustainability goals, companies can drive safer, smarter and more cost-effective operations.

"In the first year of using Kognitwin, we developed use-cases to reduce our operating cost by about three million US dollars, which actually beats the investment."

Rolf Einar Sæter,

Business Improvement and Technology Manager, Norske Shell

Section 03

Kognitwin® Simulation

Power your industrial operations

Unexpected failures or downtime in the energy sector can severely impact production and profitability. On-the-job training for complex operations is expensive, time-consuming, and often impractical. Meanwhile, reducing energy consumption and emissions are key priorities in transitioning to sustainable operations.

Kognitwin Simulation provides access to a wide range of simulation models, enabling digital visualisation and contextualisation of operations from any location.

Navigate complex scenarios with high-fidelity simulations

Kognitwin Simulation enables energy organisations to build and access high-fidelity digital twin models of important facility assets. Mapping these models with relevant data allows users to visualise real-time field production operations digitally and in context, providing 24/7 access from any location. Energy operators can also leverage the power of AI to model future "what if" scenarios quickly and comprehensively for a distinct competitive advantage. This better positions them to identify issues and opportunities that will improve day-to-day operations.

Future-proof energy operations with sophisticated simulation technology

Through Kognitwin Simulation, users can access cloud-native versions of K-Spice, LedaFlow, and other simulation models to visualise and contextualise operations digitally from any location.

Generate real-time insights

Through our cloud platform and the Industrial Work Surface, you can access high-fidelity, real-time simulations that reflect the current state of your process facilities. This better positions you to identify issues and opportunities that can help you improve day-to-day operations.

Access powerful simulation capability from anywhere

K-Spice enables detailed dynamic simulation of oil and gas processes and control systems throughout the whole process lifecycle. LedaFlow is a dynamic multiphase flow simulator that ensures the safe, continuous flow of oil and gas from the reservoir to processing facilities. Further, Kognitwin offers unparalleled interoperability, seamlessly integrating with a wide range of industrial simulators.

Test designs and enhance training through "what-if" scenarios

Our cloud platform offers near-infinite scalability, so you can grab a snapshot of the current state of the simulation to run your own "what-if" cases. You can also set the system to automatically trigger optimisation, sensitivity, or look-ahead simulations that report back to you with useful findings.

Maximise cost-efficiency for ongoing operations

Kognitwin Simulation gives you access to top-tier simulations that help your organisation reduce costs overall. Moreover, you only pay for the capability you use, which helps eliminate high upfront costs and ongoing maintenance expenses.

The solution in action

Maximise safety and production by knowing how to handle a range of different scenarios

As the leading Norwegian continental shelf (NCS) operator, Equinor oversees the third-largest oil field, Johan Sverdrup. Key stakeholders like Operations Process Technicians must be prepared for any scenario. However, on-the-job training can be expensive, time-consuming, and often not feasible. Simulators help improve operators' flexibility and response time. They can also better prepare for activities like shutting down and starting up.

Knut Bolme, Process Engineer and Simulator Instructor for Equinor offered an example: "We had an incident with a tripped low-pressure compressor on Kristin. The trip sequence failed, and we had a 4-hour lockout period for a gas turbine before we could start up again."

Typically, operators are forced to prevent flaring by closing wells in such situations. This often results in significant delays as operations halt until the equipment is repaired or replaced. However, based on their immersive simulator training, the team could continue producing without risk to their people or the environment.

Gain a competitive edge in a rapidly evolving energy industry

Kognitwin Simulation empowers energy organisations to overcome costly downtime, impractical training, and emissions challenges by providing high-fidelity, real-time simulations of facility assets. This cloud-based solution allows users to test scenarios, optimise operations, and improve collaboration, driving safer, more efficient, and sustainable performance across their value chain.

> "Some of the crew members had never done this operation live before. But I have been training for it on the simulator. Based on our training, we decided that we could start up in high-pressure mode. Production could continue at a reduced rate while waiting for the low-pressure compressor to be put back in operation."
>
> Knut Bolme,
>
> Process Engineer and Simulator Instructor, Equinor

Section 04

SiteCom®

Deliver safer, smarter, and more efficient drilling and well operations

Oil and gas operators face numerous challenges in delivering optimal drilling and well operations, but the tools to overcome them are within reach. With the right insights, talent, and technology, consistent and ever more efficient operations are possible. The real question is how to realise this potential — whether by learning from offset wells to improve planning, collaborating effectively in remote teams, or leveraging real-time insights to enhance decision-making.

For over two decades, SiteCom has been at the forefront, driving the adoption of new technologies and innovative working practices to transform the drilling and well operations domain.

Powering data-driven decisions

SiteCom ensures the reliable, low-latency delivery of real-time data, laying the foundation for truly data-driven decision-making. By combining real-time data with planning and contextual insights, SiteCom applications enable a deeper understanding of critical metrics such as KPIs, hole cleaning, operation classification, and more.

Acting as the central hub for well operational data, SiteCom supports seamless integration with third-party systems through standardised, high-performance APIs, unlocking countless valuable use cases and empowering teams to make smarter and faster decisions.

Facilitate more strategic actions with a unified interface

Leverage SiteCom – the Industrial Work Surface for drilling and wells – to transform vast amounts of unstructured data into actionable insights that provide a strategic edge.

Streamline well operations planning

The Industrial Work Surface integrates onshore planning, offshore drilling, well operations, and marine data to ensure smoother and more efficient operations.

Implement real-time analysis support

Monitor well operations in real-time, optimise cost analysis, and capture lessons learned through post-well campaigns to continuously improve performance.

Advance offshore well procedures and rig automation

Integrate apps with models and simulators to optimise the planning and engineering of a complete well design while staying informed about construction progress.

Manage data securely

Maintain the safety, integration, and usability of your data within a neutral and secure ecosystem.

Optimise OpEx and improve CapEx

Achieve superior well execution and placement, reducing drilling time, optimising SME time offshore and onshore, and increasing production volumes.

Redefining the digital oilfield with a future-ready data platform

SiteCom provides a secure, vendor-neutral foundation for digital transformation in the oil and gas industry. With advanced security features that meet industry standards, it ensures data protection while enabling seamless integration from multiple sources. Powered by WITSML 2.1, SiteCom supports advanced optimisation processes and drives innovation in the digital oilfield.

In collaboration with trusted partners like Microsoft® for cloud solutions, Exebenus® for machine learning capabilities, and Keystone® for integrating planned and actual activities to enable digitally optimised processes, SiteCom goes beyond standard oilfield data to deliver flexibility, interoperability, and a robust infrastructure for ongoing innovation.

The solution in action

Optimising drilling efficiency and reducing costs with SiteCom

A mid-sized energy company undertaking a multi-well drilling campaign in a remote offshore field faced repeated unplanned downtime, leading to rising costs and delays. Fragmented data from multiple systems and providers hampered effective collaboration between onshore and offshore teams. Limited real-time performance monitoring and operational inefficiencies resulted in costs escalating by hundreds of thousands of Euros per well.

After implementing SiteCom, the company successfully integrated rig operations data, enabling real-time monitoring and predictive analytics. By connecting onshore and offshore stakeholders on a single platform, teams gained access to contextualised data, instant deviation alerts, and the ability to proactively adjust operations. SiteCom's workflow capabilities and advanced visualisations helped engineers to plan and execute drilling campaigns more efficiently, ensuring alignment across all stakeholders.

With SiteCom, even medium-sized energy companies can significantly reduce non-productive time (NPT) and achieve substantial savings in operational costs per well.

Discover why industry leaders are choosing SiteCom

Despite having more access to technology than ever, energy companies managing drilling and well operations still face persistent challenges.

With over 20 years of driving innovation in digital energy technologies, SiteCom from Kongsberg Digital helps organisations to overcome issues like fragmented data, unplanned downtime, and inefficient operations by delivering real-time insights and enabling seamless collaboration across teams. By improving decision-making, optimising performance, and reducing costs, SiteCom transforms how companies plan, execute, and monitor their drilling and well operations.

> "In drilling, any unplanned stop implies a very high cost. With SiteCom, we know what happens in real-time."
>
> Renata Martin,
> Head of InWell Control Center, Repsol

Section 05

FieldTwin®

Cut field development time from months to weeks

Energy operators and EPCs face myriad challenges when planning and executing offshore energy and subsea developments. With complex multidisciplinary work spanning different phases, project partners must often overcome communication barriers, siloed information and inefficient workflows that extend timelines and increase project risks.

With real time collaboration, insights and decision making for every team involved with energy projects, FieldTwin enables operators and EPCs to:

- Design and optimize field layouts together in one shared digital space
- Visualize field data in 3D, from early concept through to operations
- Work together with controlled access to shared field data

Transform how you design, view and collaborate on offshore fields

All in one platform for operators and EPCs to design, visualize and collaborate on energy infrastructure projects, FieldTwin accelerates field projects across the whole energy sector, from subsea oil and gas to offshore wind.

Tailored for teams across engineering, operations, digital and IT, as well as business leaders, FieldTwin empowers project teams to:

Version control for field designs

Track every change and roll back to any previous version, ensuring you never lose important design decisions.

Track costs as designs are happening

See how design changes impact project costs instantly within the platform, with automatic calculations per meter of pipeline.

View ROV survey data

By connecting survey data directly to your field layout, FieldTwin enables issues to be spotted before they become problems.

Collaborate across companies securely

Within FieldTwin, designs can be shared with controlled access for operators, EPCs and wider supply chain, keeping everyone synced on the latest version.

Make decisions with integrated data

With the ability to import multiple data sources into one unified view, teams can see how changes impact whole fields immediately within FieldTwin.

Keep projects moving with trackable workflows

FieldTwin enables teams to create and assign tasks directly on field elements, from design reviews through to operational checks.

Field development from concept to operation

FieldTwin provides everything you need for field development planning to operations, across the energy mix. Including capabilities across the visualization and design, data integration and collaboration between project partners.

FieldTwin can:

Accelerate subsea field development

Cutting traditional planning time by 70%, FieldTwin allows users to design everything from Christmas trees to risers and design optimized turbine layouts and cable routes, while reducing planning cycles and visualizing cost implications in real-time in one shared digital space.

De-risk complex projects with digital twin technology

Visualize your entire field - from seabed to topside or turbine – to optimize flow assurance and make decisions with confidence using accurate bathymetry and integrated reservoir data.

Connect your project teams

Break down silos between operators and EPCs. Share designs with controlled access for various teams, ensuring everyone works from the latest version and that potential problems can be identified.

Monitor with confidence

Get real-time updates from your assets with no more outdated or fragmented data. Enjoy software, operating system and browser compatibility allowing you to work from anywhere in the world on critical projects.

The solution in action

Leveraging advanced digital twin software for critical subsea projects

Heavy-asset organisations must balance their need for energy security with the urgent push to reduce carbon emissions. But demonstrating the ability to operate far more efficiently while reducing emissions and mitigating risks isn't so easy.

FieldTwin is a collaborative data platform used to help plan, implement, and operate energy projects featuring critical subsea assets — from start to finish. Through FieldTwin integration, users can quickly launch simulations to help develop optimised energy field layouts without exporting data or setting up separate simulations.

As a result, simulations can run immediately and return results directly into FieldTwin. This allows engineers to modify designs accordingly and in real-time.

Shaping the future of offshore energy

FieldTwin empowers energy companies to overcome the complexities of subsea and offshore developments by providing a secure, collaborative platform that simplifies design, streamlines workflows, and accelerates decision-making. By reducing planning time, managing risks, and optimising costs, FieldTwin enables faster project delivery, better resource management, and a clear path to achieving operational and sustainability goals.

> "FieldTwin transformed our subsea planning. What used to take six months in traditional tools now takes six weeks."
>
> Engineering Manager, Subsea 7

Section 06

Kognitwin® Grid

Manage a more efficient and reliable grid

Energy system stakeholders face a wide range of challenges. As the number of energy customers and powered devices grows, demand for electric power continues to increase.

New and evolving technologies like solar panels (PVs) and electric vehicles (EVs) are viewed as positive changes but can complicate grid management. Meanwhile, many grid operators don't have access to the centralised data or insights that would help them manage their grids more effectively.

Kognitwin Grid delivers a digital twin of the power grid, providing operators with a complete and actionable overview of assets and operations.

Gain better visibility across a range of systems and grids

Kognitwin Grid facilitates a digital twin of the power grid, giving operators a holistic overview of its assets and operations. With key power system assets mapped into Kognitwin Grid, operators are better positioned to automate processes, execute timely decisions, and make more efficient grid investments.

Access critical data quickly

With a digital twin model of your electric grid, utility managers can replace siloed and fragmented data located in multiple systems with immediately accessible contextualised data. So, rather than spend time hunting for specific technical information when a situation arises, grid operators always have actionable data at their fingertips.

Improve reliability

Be aware of upcoming operational situations and create scenarios, including topology changes and/or using flexible assets to alleviate and reduce the risk of overload-based outages.

Create test grid scenarios

Kognitwin Grid has an always-on simulator engine that performs a complete power flow analysis across all voltage levels, including forecasts of future near-time or long-term load flow in the power grid to increase insights and support decision-making from planning to operations.

Optimise investments

Plan and develop a future-proof grid by running long-term grid scenarios to assess the impact of electrification and new intermittent energy. This also enables utilities to test and refine various grid scenarios before investments are made or work begins.

The solution in action

A Norwegian power grid company explores condition-based maintenance with Kognitwin Grid

Traditionally, substation maintenance has been carried out using a calendar-based approach, where inspections and service tasks are scheduled at fixed intervals, regardless of the actual condition of the equipment.

Glitre Nett is utilising Kognitwin Grid to continuously monitor the health of switches and other critical infrastructure components, aiming to gain valuable insights for optimising condition-based maintenance.

The pilot with Kognitwin Grid provides valuable lessons on the potential of digital tools in grid operations. Still, its findings will shape future considerations rather than representing a solution ready for full-scale implementation today.

"This pilot is an important step in learning how we can improve maintenance practices. While we are still in the early stages, it gives us valuable knowledge about how we might work smarter in the future by incorporating new digital tools."

Otto Andreas Rustand,

Head of Digitalisation, Innovation and IT Security, Glitre Nett

Reimagine the way you operate

Rapid changes related to increased electrification mean we must improve how energy systems are planned and operated. Kognitwin Grid is the digital twin solution that enables better decisions, automated processes, and more efficient grid investments.

Summary and takeaways

Professionals in heavy-asset industries face significant challenges, including disconnected systems, siloed operations, and slow decision-making. These challenges hinder efficiency, innovation, and sustainability.

The Industrial Work Surface offers a transformative solution by unifying data, applications, and workflows into a single platform, enabling streamlined operations and actionable insights.

Access many solutions through one unified work surface

Here are some individual solutions that work within the Industrial Work Surface:

- Kognitwin enables users to access digital twin versions of their assets.
- Kognitwin Simulation empowers organisations to leverage simulation models within a digital twin environment, providing access to high-fidelity models of critical facility assets.
- SiteCom facilitates a complete ecosystem for safe, reliable drilling and well operations.
- FieldTwin allows energy companies to make smarter, faster decisions throughout the lifecycle of their subsea development projects.
- Kognitwin Grid facilitates a holistic overview of power grid assets so operators can automate processes, execute timely decisions, and make more efficient grid investments.

About Kongsberg Digital

Kongsberg Digital is an industrial software company shaping the future of work by changing how businesses design, operate, and maintain their assets. Businesses trust us for our innovative carbon capture and storage technology, new energy ventures towards net-zero, emissions reduction, and technology to help balance complex power systems. We are transforming carbon-intensive industries by providing industry-leading solutions that extract value from industrial data. We enable businesses to connect physical assets to an industrial work surface, serving as one common infrastructure for decision-making across the value chain.

Help your heavy-asset organisation gain a competitive edge

Contact us to discover how Kongsberg Digital solutions can help you reach new levels of intelligence and productivity.

Watch a demo