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Navigating the Issues That Prevent Industrial Organisations From Fully Leveraging AI

Maximising your AI returns by avoiding common pitfalls



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Introduction

Implementing AI can enhance operational efficiency and unlock new levels of innovation for organisations in areas such as energy, utilities, renewables, manufacturing, and maritime.

In fact, a recent Kongsberg Digital <u>survey of professionals</u> across these sectors found that they strongly believe that AI will play a significant role in the future of their work.¹ Three-quarters (75%) of those surveyed expect their organisation will invest in or use Generative AI over the next three years. Only 1% of respondents thought that their organisation would not use AI over the next three years.



However, realising these benefits has proven more challenging than many companies anticipated.

Machine learning (ML) is not a process of chance; it involves navigating various factors such as complexity, collaboration, decision-making, and quality. Developing robust ML models and producing consistent results across different contexts requires an agile, iterative approach. Different ML teams may adopt varying methodologies to achieve these outcomes.

But, for any organisation using AI, a key objective is to deliver value swiftly and effectively by addressing real-world business challenges. Integrating AI into complex industrial environments often uncovers many obstacles, ranging from outdated legacy systems to the scarcity of in-house AI expertise.

This Playbook outlines these challenges and offers practical ideas on overcoming them.

Why Al initiatives are challenging to implement and maintain for industrial organisations

Many companies have discovered that benefiting from Al's enormous potential has been more complicated than expected.

Here are some of the main reasons why:

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Legacy systems and lack of digitalisation

Outdated systems hinder the seamless integration of AI, often requiring costly infrastructure upgrades.

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Data silos and inconsistent data

Siloed and inconsistent data delays AI implementation, as a highquality, integrated data set is essential for training AI models.



Lack of Al expertise

Many industrial organisations lack the in-house AI and data science expertise needed to implement and maintain AI solutions.

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Complex operational environments

The complexity and variability of industrial operations make it challenging to develop AI models that can accurately predict or automate processes.



High regulatory and compliance demands

Strict regulations require additional resources to ensure AI systems meet safety and compliance standards, complicating implementation.



Cybersecurity risks

Al systems' reliance on interconnected devices exposes organisations to cyber risks, adding complexity to securing and maintaining Al.



Costs and unclear ROI

High upfront costs and uncertain ROI make it difficult to justify AI investments in the short term, especially for budget-conscious companies.



Cultural resistance to change

Resistance from employees and leadership due to fears of job displacement or unfamiliarity with AI can stall adoption.



Long lifecycle of industrial assets

Retrofitting long-lived industrial assets to be AI-compatible may be deemed impractical or too expensive.



Difficulty scaling up from proof-of-concept models

Scaling AI projects beyond small pilots requires overcoming numerous technical and operational challenges.



Uncertainty in AI outcomes

The uncertainty of AI predictions in high-risk environments makes organisations hesitant to fully trust AI systems.



Integration with Operational Technologies (OT)

The complexity of integrating AI with highly reliable and precise OT systems may add additional hurdles to implementation.

A recent <u>Kongsberg Digital survey</u> shows that while many organisations are in the early days of their journeys with AI, Generative AI is already being used by industrial professionals to streamline, expedite, and improve their daily work.² Nearly all (94%) survey respondents said they see some efficiency gains from AI in their role.

In terms of streamlining, expediting, or improving work in their roles each day, industrial professionals say that Generative AI





Drive more value from Al initiatives by building and maintaining a solid foundation

Here are some steps you can follow to better position your organisation to leverage AI for innovation and efficiency:

1. Make sure your organisation is digitally enabled

For Al initiatives to succeed, many industrial organisations must push further in their digital transformation journey. This means updating legacy systems, integrating IoT, sensors, and cloud computing, and building the infrastructure to collect, process, and store massive amounts of data. Digital enablement ensures that Al can interface with operational technologies (OT) and be applied across your organisation's value chain.





of industrial professionals say that they don't have access to tools that would help monitor, manage, and optimise performance.³

Kongsberg Digital

2. Build a strong data strategy

Driving significant value from AI requires a robust, integrated data strategy. Since data silos and inconsistent formats are common, your organisation must have policies and tools in place to ensure data is clean, accessible, and unified across departments. A clear <u>DataOps strategy</u> must define how data is collected, processed, stored, and utilised to inform AI models. Using this approach, data specialists should identify data silos – and how they can be dismantled – to permit use in machine learning, Generative AI, and other collaborative activities across the organisation.



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3. Encourage key personnel to prioritise collaboration

Breaking down silos requires cross-functional collaboration between data scientists, IT, engineering, and operations teams. Al initiatives depend on a holistic approach, where data flows freely between departments, and each team understands how Al will impact their work. Fostering collaboration promotes knowledge-sharing and the seamless integration of Al into processes, reducing friction between both people and IT systems — and maximising success.

of industrial professionals say that work silos prevent collaboration and innovation. ⁵

Kongsberg Digital



4. Focus on business value

Al initiatives should be more than technology-driven experiments; they must align with your business goals. Industrial organisations must clearly define the business value Al is expected to deliver, such as reducing costs, enhancing safety, or improving sustainability. By staying focused on these outcomes, you can justify investing in Al and measure success based on real-world impact.

"Identify the organization's AI ambition and investment focus by working with business leaders to determine strategic intent to use AI to defend, extend or upend your competitive position and industry. Align your GenAI portfolio to your ambition." ⁶

5. Embrace Decision Intelligence

Decision intelligence is about leveraging Al to improve decision-making by providing insights derived from vast amounts of data. Industrial organisations can use Al to predict outcomes, model scenarios, and simulate the effects of different decisions on operations, supply chains, and energy usage. Empowering your leaders with Al-driven insights can enhance strategic and operational choices, leading to better resource allocation and reduced risk. These insights can also help lay the groundwork for effective, reliable autonomous systems and processes.

"To support and enable greater automation, oil and gas companies will need to augment asset and process design capabilities with mapping, modelling and design to improve decision making."⁷

Gartner

Gartner

6. Keep Intelligent Assets and Intelligent Operations in mind

Industrial organisations must move toward intelligent assets — machines, equipment, or systems that can selfmonitor, report, and optimise their performance autonomously through AI. Digital twins, IoT devices, and real-time data streams help AI understand asset conditions, predict failures, and optimise maintenance — often without human intervention. By shifting toward intelligent assets, you can maximise uptime, reduce costs, drive sustainable practices, and build increasingly autonomous processes and systems.



7. Set target outcomes and define your purpose

Clearly defining Al initiatives' purpose and target outcomes helps stakeholders understand why Al is being deployed. This can range from optimising production to enhancing safety or sustainability. Setting measurable goals ensures Al projects are aligned with strategic priorities, reducing the risk of failure due to misalignment. Every stakeholder has a common goal to work towards, so resources move toward the same outcomes.

"Rather than asking whether AI can improve performance in a specific process, you should ask if AI is helping your business as a whole differentiate itself from your competitors, while helping you become more resilient to the disruptors coming for your business. Is AI allowing you to go after a new market or reimagine your business model?" ⁸

8. Introduce machine learning and AI into operational processes

Machine learning (ML) and AI should be introduced incrementally and strategically into daily operations. Start by automating repetitive tasks or using predictive analytics to support critical operations, like predictive maintenance or supply chain optimisation. Over time, AI's role can be extended to more complex areas, such as resource allocation or failure prediction, ensuring that human operators remain in the loop for oversight. Generative AI copilots can help employees apply data and insights to practical situations and increase their productivity, simplifying tasks that would previously have required a skilled data scientist to complete.



9. Decide which LLM and AI to use for your workflows

You must select large language models (LLMs) like GPT or domain-specific AI models based on the specific needs of your workflows. For example, if real-time decisionmaking is essential, you'll need AI with robust natural language processing (NLP) capabilities for interpreting operational data. Understanding the strengths and limitations of different AI tools allows organisations to choose solutions that best fit their workflows and infrastructure. It may be that your goals are best served by multiple LLMs, which will require a suitably flexible underlying technology platform.

10. Foster a culture of Al fluency and innovation

To overcome cultural resistance to Al, leaders must promote a culture of Al fluency and innovation. This involves educating employees about how Al can augment their roles rather than replace them and creating an environment where experimentation and innovation are encouraged. Supporting teams to think creatively about Al applications fosters buy-in and makes Al-driven transformation smoother.

"Debunking myths will be critical to helping both leaders and employees from falling into an isolationist mindset. Education, experimentation, and a positive culture of responsible adoption will all be essential to pave a path of growth with generative Al."⁹

KPMG

11. Aim to close any talent gaps

Many industrial organisations need more Al talent, making it crucial to identify and close skill gaps. This may involve hiring Al specialists, data scientists, and engineers familiar with Al systems or retraining current employees to work effectively with Al technologies. Addressing talent shortages ensures that Al initiatives can be developed, deployed, and maintained effectively.



56%

of businesses in the oil & gas industry see a lack of Al talent as their greatest barrier.¹⁰

EY

12. Offer training

Al requires ongoing training and upskilling to ensure your teams remain competent with the new tools and technologies. Offering continuous learning programs helps employees stay updated on Al advancements, making them more comfortable with new processes. Training also boosts morale, assisting employees in understanding how Al will enhance their roles and allowing them to contribute to Al initiatives.



of employees are cautious that Al-powered devices will make what they do less relevant to their employer.¹¹

Insight

13. Prioritise use cases

With limited resources, industrial organisations must prioritise use cases that deliver the most immediate value. Focus on AI initiatives that align with your business goals, provide quick wins, or address pain points such as predictive maintenance, energy efficiency, or supply chain optimisation. Starting with high-impact use cases can help gain organisational momentum and set the stage for broader AI adoption.

"Reviewing maintenance reports and spending time with workers on the front lines can help determine where a gen Al copilot could make a big difference, such as in identifying issues with equipment failures quickly and early on."¹²

McKinsey Digital

By applying these strategies, industrial organisation leaders can navigate the complexity of AI implementation and successfully scale initiatives that deliver tangible business value, streamline operations, and boost innovation.

Use case: Empowering grid resilience with Al

Power grid operators can leverage AI to navigate the complexities of grid management.¹³



Objective

Leverage AI to enhance a power grid's efficiency, reliability, and sustainability.



Challenge

Forecast energy consumption trends to optimise grid utilisation and manage energy dispatch.



Solution

Implement AI algorithms for load forecasting by analysing large datasets to predict consumption accurately. These algorithms also support grid operators by optimising grid resources, managing dispatch, and improving load flow analysis.



Outcome

Power utilities can navigate current and future operations more effectively, ensuring efficient resource allocation and strategic decision-making.



Impact

Strategic application of AI helps deliver increased operational efficiency, reliability, and sustainability for utilities managing complex power grids.

Source: "Empowering Grid Resilience with AI," Surender Redhu, Kongsberg Digital, May 2024

Get the most from your AI efforts with Kongsberg Digital

Kongsberg Digital is a leader in technology for heavy-asset industries. Our commitment to keeping humans at the centre of technology allows us to integrate AI into every aspect of our work. We provide a self-service solution that gives all of your key stakeholders a better way to visualise, orchestrate, and automate complex work.

Kongsberg Digital has deep experience empowering industrial workers to do their work faster, more accurately, and more efficiently by leveraging advanced simulation technology, machine learning, and Generative AI (Gen AI).

The Industrial Work Surface allows users to engage with large language models (LLM) and Generative AI Copilots through an easy-to-use interface — and connect seamlessly with your asset and operational data landscape. Built with DataOps principles in mind, our solutions help you generate more productive, costefficient, and reliable operations through a single user experience.



Summary and takeaways

Organisations competing in heavy-asset industries face many challenges when trying to leverage AI. Key obstacles include outdated legacy systems that slow digital integration, data silos that prevent effective AI model training, and a lack of in-house AI expertise. The complexity of operations and high regulatory demands further complicate the development and deployment of AI. Many other companies need help moving forward on AI-related initiatives due to uncertain ROI and cultural resistance from employees.

To overcome these hurdles, companies must prioritise digital enablement, including upgrading systems and ensuring data is accessible across departments. Building a solid data strategy that dismantles silos is critical for AI success, as is fostering cross-functional collaboration to align Al efforts with business objectives. Focussing on Al's business value, such as reducing costs and improving safety, can help justify investments and demonstrate clear returns. Decision Intelligence can also be vital in optimising operations and enhancing decision-making using Al insights.

By embracing these strategies and focussing on targeted use cases, industrial organisations can successfully scale AI initiatives, achieve meaningful results, and drive innovation across their operations.



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, voyage optimisation, emissions reduction, and technology to help balance grids and 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.

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See how innovative AI technology is used to improve industrial operations

In a new video, the Kongsberg Digital team demonstrates how an Asset Copilot can be used to execute work faster, more accurately, and more efficiently every day.

See the video



