

**Blackbook** 

# **AI, Automation and Data Solutions for the Offshore Energy Industry**

Blackbook AI in Offshore Energy



## The Industry is at an Inflection Point

The offshore energy industry has never generated more data. Sensors on every asset, footage from every inspection run, transactions from every supplier, alerts from every monitoring system. The data exists. The problem is that most of it sits unused, buried in disconnected systems, reviewed manually by people who are already stretched thin, or never looked at again after it was collected.

At the same time, the industry is navigating a set of compounding pressures that make the status quo increasingly expensive to maintain. Costs of unplanned downtime have surged by over 76%, now reaching \$149 million per site across the industry (Innovapptive). Nearly half of the global offshore workforce is over 45 (Airswift GETI Report), and 66% of the oil and gas workforce is in mechanically intensive roles (Deloitte Oil and Gas Industry Outlook), making knowledge transfer and workforce augmentation an urgent operational priority.

Deloitte's analysis of IDC and Gartner data projects that AI and generative AI will account for more than 50% of total IT spending by US oil and gas companies by 2029, up from less than 20% today (Deloitte). The operators accelerating fastest are those treating data as an operational asset rather than a record-keeping obligation.

This document outlines how Blackbook AI is helping offshore operators do exactly that, across three areas where the gap between current practice and what is now possible is widest.

Digital initiatives will save the oil and gas sector more than \$320 billion over 2026 to 2030, with the biggest gains in predictive maintenance, drilling optimization, reservoir management, and autonomous operations (Rystad Energy, 2025).

# Insights Across your Digital Supply Chain

Offshore and energy supply chains are among the most complex in any industry.

Offshore and energy supply chains are among the most complex in any industry. A single capital project can involve hundreds of global suppliers, multiple fabrication yards, millions of individual materials, and billions of dollars in contracted scope. Most operators are managing these supply chains with disconnected systems, lagging reports, and manual reconciliation processes that were designed for a different era.

Supply chain disruptions affect 28% of offshore project timelines (Deloitte). By the time a problem surfaces in a weekly report, it has often already impacted the critical path. Emissions reporting requirements are tightening across every major offshore jurisdiction, and most operators are disclosing against targets they cannot measure with confidence.

## Use cases in this space

### 1) Scope 3 Emissions Tracking Dashboard

A live platform connecting supplier, procurement, and logistics data to track Scope 3 emissions by category, by supplier, and against reduction targets in real time. Regulator-ready reporting in hours, not weeks.

### 2) Procurement Analytics & Material Tracking

Live visibility into material status, delivery risk, and spend performance across complex offshore capital projects. At-risk deliveries flagged weeks before they impact the critical path.

### 3) Automated Accounts Payable & Vendor Reconciliation

AI-powered invoice processing that automatically matches purchase orders, goods receipts, and invoices. Over 80% of invoices processed without human touch.

## Scope 3 Emissions Tracking Dashboard

### The Challenge

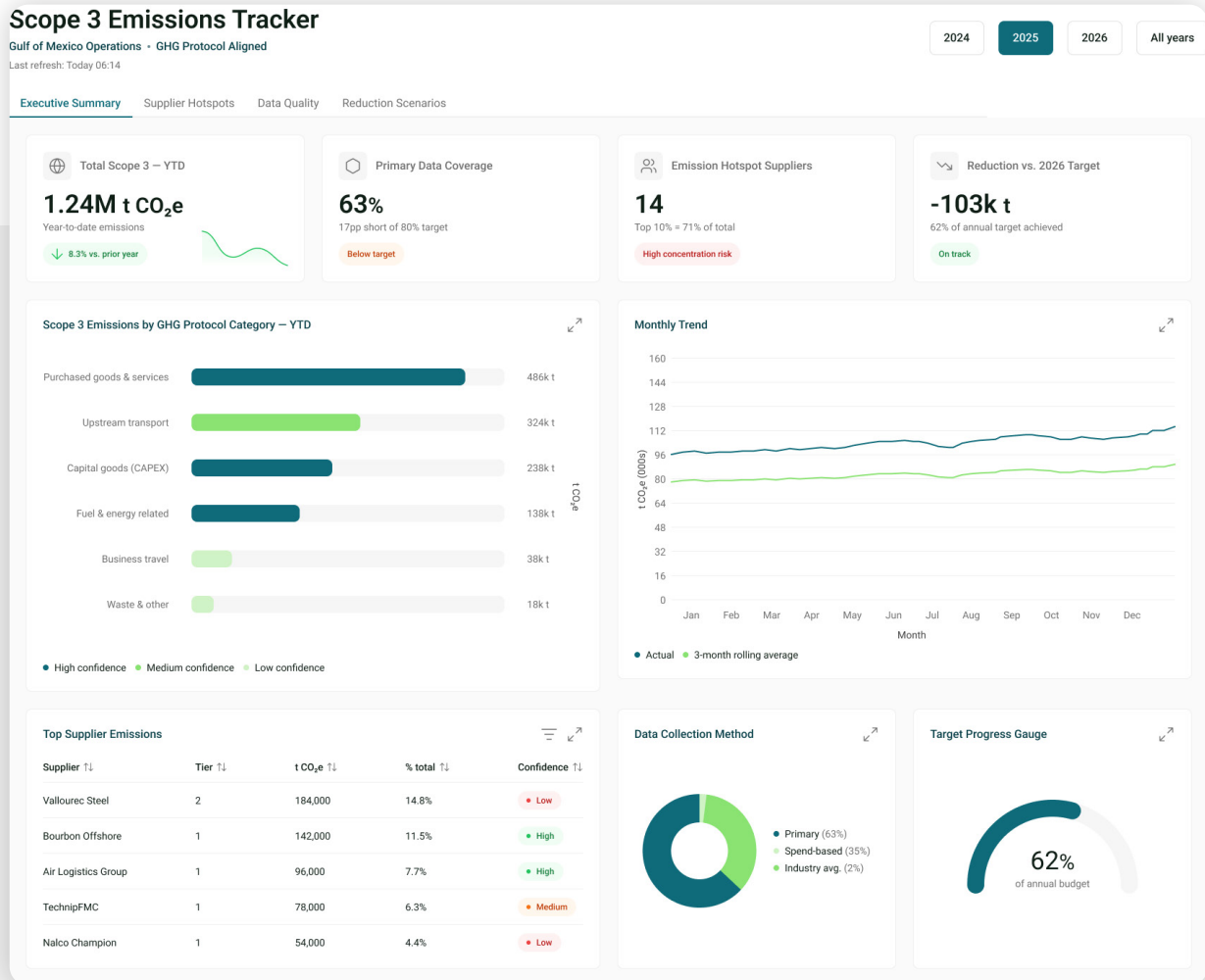
Regulatory pressure on Scope 3 emissions reporting is accelerating across every major offshore jurisdiction. Operators are required to measure, disclose, and demonstrate progress against emissions targets across their entire value chain, covering not just their own operations but their suppliers', contractors', and logistics partners' too.

The data required to do this accurately is scattered across procurement systems, finance platforms, logistics providers, and dozens of supplier relationships. Most operators know their exposure is significant. Few can measure it with confidence. The result is reporting built on estimates and partial data, exactly the kind of disclosure that regulators and investors are increasingly scrutinizing.

### The Solution

A live Scope 3 Emissions Tracking Dashboard that pulls together supplier, procurement, logistics, and finance data into a single platform. Emissions are categorized to GHG Protocol standards, scored by data confidence level, and tracked against reduction targets in real time.

The dashboard gives sustainability teams a complete view of total Scope 3 exposure by category, from purchased goods and upstream transport to capital equipment and business travel. It identifies top emission hot spot suppliers automatically, ranked by contribution and confidence level. It models the emissions impact of procurement substitutions before decisions are made. And it produces regulator-ready reports in hours rather than weeks, auditable, versioned, and aligned to international disclosure standards.



Scope 3 emissions tracking dashboard

## The Outcome

Sustainability teams stop building quarterly reports from spreadsheets. Procurement teams have a ranked list of which supplier relationships to address first. Executives have a live view of where the organization stands against its targets, with the evidence to demonstrate it to regulators and investors with confidence.

## THEME 2

# Augmenting your Operations with AI Assistants

Nearly half of the offshore workforce is over 45, risking significant knowledge loss as retirees exit the industry (Airswift GETI Report). The engineers who know extended industry and workplace knowledge are leaving. What replaces them is banks of data that cannot be search efficiently.

At the same time, the volume and complexity of operational data that today's control room teams are expected to manage has never been greater. A typical offshore platform runs 30,000 sensors (McKinsey), generating a continuous stream of data that current systems were never designed to analyze in real time. Early adopters of AI-assisted operations have reported up to 40% fewer equipment failures and annual savings of \$10 million per site (Deloitte Oil and Gas Industry Outlook).

## Use cases in this space

### 1) Operator Decision Dashboard

An AI-powered operations platform that consolidates every alert, ranks them by risk, and surfaces plain-language recommendations and pre-drafted workorders for engineer review. Alert-to-action time reduced from hours to minutes.

### 2) GenAI Knowledge Assistant

A custom AI assistant trained on your organizations own technical documentation. Engineers ask questions in plain language and receive cited, accurate answers drawn from your manuals, records, and procedures.

### 3) Workforce Scheduling & Resource Planning

AI-assisted scheduling that optimizes workforce deployment across complex offshore programs, balancing competency requirements, availability, and operational priorities.

## Operator Decision Dashboard

### The Challenge

The costs of unplanned downtime have surged by over 76%, reaching \$149 million per site across the oil and gas industry. Most equipment failures are preceded by data patterns that existed in monitoring systems before anyone had time to investigate them. The bottleneck is the time it takes to turn an alert into a decision.

Operators on shift are managing multiple monitoring systems with no single prioritized view. Triage takes hours. Root cause investigation takes longer. By the time a decision is made, production has already been affected.

### The Solution

We build an AI-powered Operator Decision Dashboard, a single screen that consolidates every alert across monitoring systems, ranks them by risk and operational impact, and surfaces plain-language recommendations alongside a pre-drafted workorder for engineer review.

The dashboard monitors connected systems continuously, classifies anomalies, matches patterns against historical events, and generates contextual guidance that engineers can act on immediately. An operator can ask in plain English: "Why is TH-07 ESP temperature rising and what should I do?" and receive a specific, asset-referenced response in seconds, without a manual data pull or a phone call to a colleague.

The dashboard tracks production efficiency live, shows which wells are under active AI optimization, and generates automated shift handover summaries capturing every decision, alert, and action taken during the shift for the incoming crew.

### The Outcome

Alert-to-action time drops from hours to minutes. Operators know exactly where to focus the moment they sit down. Engineers spend their time on decisions rather than triage.

## Thunderhawk FPSO – Operations Centre

Updated 2 min ago by AI agent

Agent types →

Shift handover →

Active Alerts

3

Production Efficiency

94.2%

Wells on AI Optimisation

11/14

Decisions Assisted Today

47

## AI-Prioritised Action Queue (4)

## ESP motor temperature – Well TH-07

Predicted failure in ~ 18 hours • 94% confidence

High risk

Advise &gt;

## Choke valve suboptimal – TH-03 &amp; TH-09

+340 BOE/day available • Auto-apply ready

Medium risk

Review &gt;

## Gas lift injection rate – TH-11

Reduce 8% • Save 420 Mfc/d injection gas

Medium risk

Review &gt;

## Pig launch schedule – Export line

Model suggests 6-day delay is low risk

Low risk

Details &gt;

## AI Agent – Natural Language Query

Engineer

Why is TH-07 ESP temperature rising and what should I do?

AI agent

TH-07 motor temperature has risen 8°C over 6 hours – pattern matches bearing wear seen in TH-04 (Jan 2024).

Recommend reducing drawdown 15% and scheduling pull within 48 hours. Deferring risks a wet pull.

I've drafted a workorder – review?

How it works →

Deployment →

FPSO operations center dashboard with AI-prioritized action queue

40%

Reduction in equipment failures reported by early adopters of AI-assisted predictive maintenance, with annual savings of \$10 million per site.

Source: Deloitte Oil and Gas Industry Outlook, 2026

THEME 3

# AI and Machine Learning for Subsea Asset Integrity

Unplanned subsea maintenance costs up to 15 times more than planned intervention.

For topside equipment that is accessible and well-instrumented, reactive maintenance is expensive. For subsea assets operating at depth, it can be operationally and financially catastrophic.

The challenge facing most integrity teams is not a shortage of data. After every inspection campaign, every pigging run, every ROV survey, operators collect substantial volumes of sensor readings, video footage, wall thickness measurements, and operational history. The challenge is that this data sits in disconnected systems, reviewed manually by teams working through growing backlogs, producing insights weeks or months after the inspection took place.

The Deloitte 2026 Oil and Gas Industry Outlook identifies shifting toward prescriptive and self-healing maintenance, while leveraging robotics, drones, and zero-touch sensors for automated inspections, as a critical priority for operators managing aging assets.

## Use cases in this space

### 1) Subsea Asset Integrity Platform

A unified digital model per asset integrating sensor data, ILI and pigging results, ROV data, and operational history. Continuous ML analysis across degradation modeling, risk-based inspection scoring, and life extension assessment.

### 2) Automated Subsea Inspection Platform

A computer vision platform that automatically analyses ROV and subsea inspection footage to detect and classify anomalies. 20x faster than manual review. 15% more defects detected.

### 3) Predictive Maintenance for Offshore Equipment

Production-grade ML models trained on your SCADA and historian data, predicting equipment failures 7 to 14 days in advance and automatically generating workorders in your CMMS before a fault occurs.

## Subsea Asset Integrity Platform

### The Challenge

Subsea integrity teams manage data from multiple disconnected sources. CP sensor readings are in one system. Pigging and ILI results are in a folder somewhere. ROV reports are in SharePoint. Operational flow and pressure history is in the historian. Design documents are on a server from a decade ago. When an integrity engineer

needs to assess the condition of a specific asset, the first two weeks are spent gathering the data before any engineering has started.

The result is that risk-based inspection assessments take months, life extension studies are major engineering programs in their own right, and inspection planning is still largely calendar-driven rather than risk-driven. Meanwhile the assets are aging and the regulatory environment is tightening.

### The Solution

We build a unified Subsea Asset Integrity Platform that creates a single digital model per asset, pulling in all data sources and running continuous ML analysis across three dimensions: how fast is this asset degrading, what is the risk score, and how much life does it have left.

The platform ingests data from CP sensors, ROV and AUV video, ILI and pigging results covering wall loss and geometry, operational flow and pressure history, and design and certification documents. Three ML engines run continuously against this unified model. A degradation engine models corrosion, fatigue, and erosion rates. A Risk-Based Inspection engine scores every asset on Probability of Failure multiplied by Consequence of Failure. A life extension engine assesses remaining useful life and fitness-for-service.

Outputs are automated, auditable, and regulator-ready. Anomaly alerts are ranked by risk and auto-notified to the right people. Risk-prioritized inspection plans replace calendar-based scheduling. Life extension reports are aligned to BSEE, NOPSEMA,

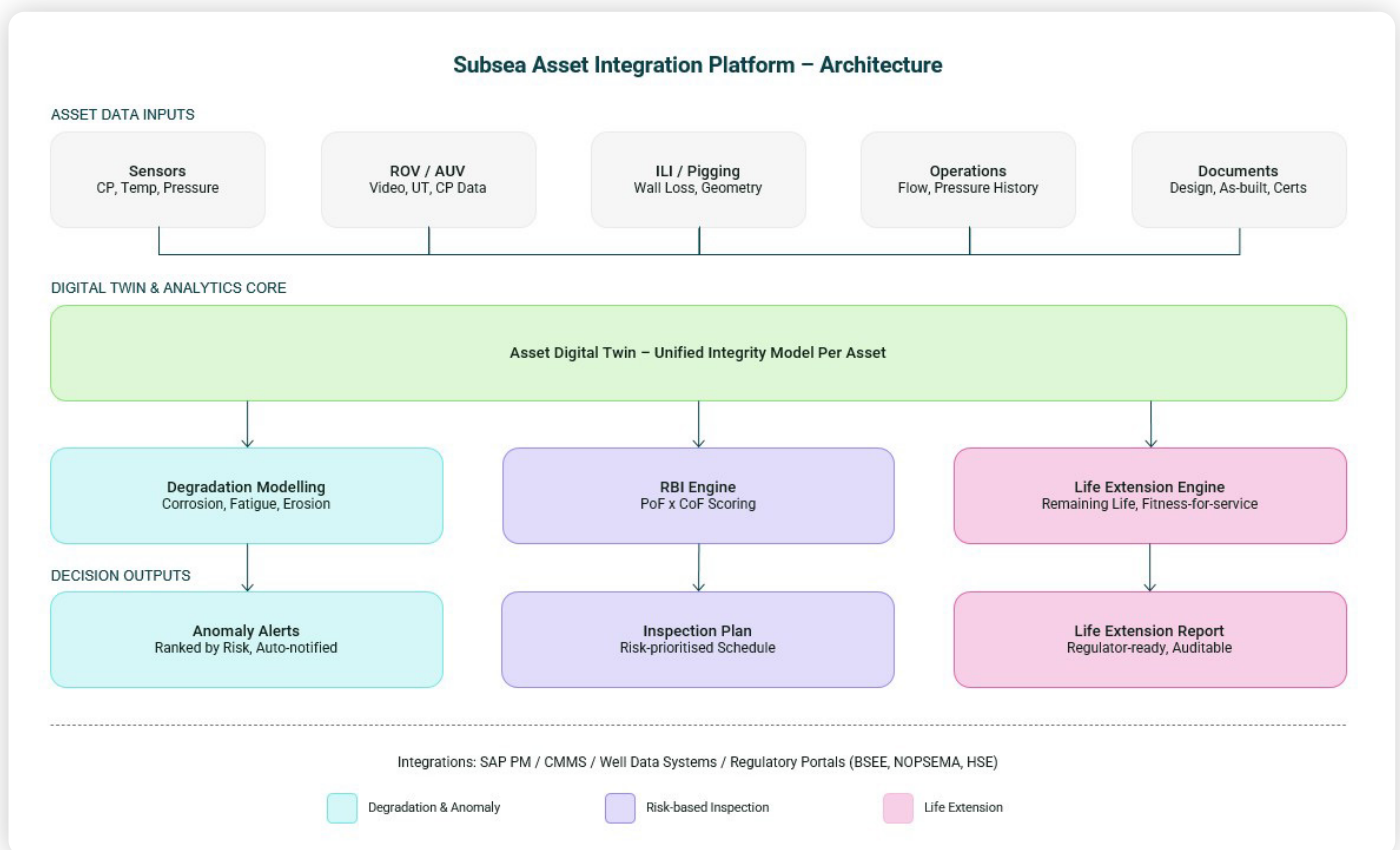
and HSE requirements. The platform integrates with SAP PM, CMMS, well data systems, and regulatory portals, fitting into your existing workflows rather than replacing them.

**The Outcome**

Risk-based inspection assessments that took weeks of manual engineering are produced continuously and automatically.

Inspection resources are focused on the assets that need them most. Life extension decisions are supported by a complete, auditable data picture rather than a partial engineering judgment.

**15–20%** Reduction in unplanned downtime reported by early adopters of digital twin technology in oil and gas operations.



Architecture diagram of a subsea asset integration platform

## PIPE AI: Automated Pipe Defect Detection

Pipe AI is Blackbook AI's production computer vision platform for automated pipe inspection.

The platform automatically analyses CCTV and inspection footage to identify and classify pipe defects, processing footage at 1.8 times real-time speed and operating continuously around the clock. Its ML model detects over 100 defect types across 66 defect families, including cracks, root intrusion, joint failures, and structural deformation. It continuously retrain on new data, improving detection accuracy over time.

Beyond detection, Pipe AI generates automated asset scores based on age,

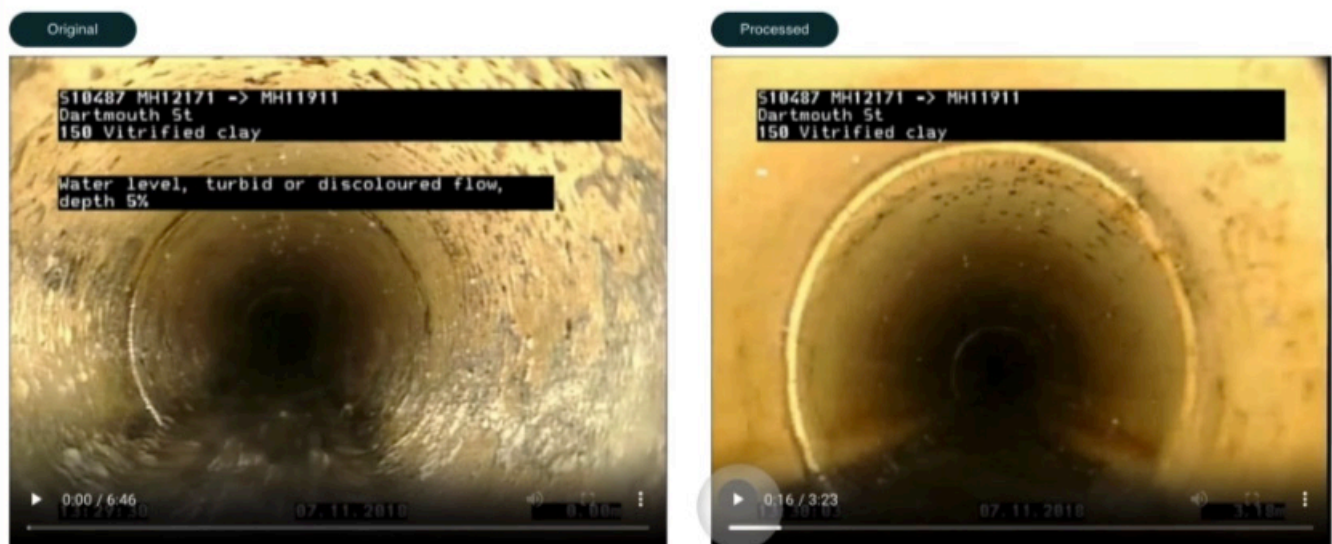
material, and inspection history, producing a risk-prioritized maintenance schedule and one-click inspection reports. Predictive failure modeling supports two-year maintenance budget forecasting, giving finance and risk teams the forward visibility to plan preventive repairs rather than respond to failures.

**20x** faster than manual review.

**15%** more defects detected compared to human assessment.

**24/7** automated assessment

Video Name: S10487.mp4



Side-by-side original and processed video footage detecting pipe defects

# Contact Us

Blackbook AI is a global technology consulting company with offices across Australia, Asia, and North America. We have spent nine years building AI, automation, data, and digital solutions for some of the most operationally complex industries in the world, including agriculture, transport, insurance, utilities, mining, and energy.

We work across five service lines: AI, Automation, Data, Digital and Low-Code platforms, and Managed Services. Our proprietary agentic AI platform, Action Fabric, unifies AI insights, automation workflows, and human input into a single operational layer that connects across your existing systems and processes.

We have delivered 2,000+ successful projects for 180+ clients. The problems offshore operators face, aging assets, knowledge loss, inspection backlogs, and supply chain complexity, are problems we have been solving in complex environments for years.

**200+**

Staff across Australia, Asia, and North America

**9+**

Years of AI and automation delivery experience

**2,000+**

Successful projects delivered

**180+**

Clients globally

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