

SoftServe

Physical AI for Oil & Gas Robotics Operations

Improve safety, efficiency, and operational intelligence across onshore, offshore, and subsea operations.



ROBOTICS AS A SOLUTION



UNDERWATER & SUBSEA INSPECTIONS

Drones and crawlers perform inspections and data collection, with simulation-based mission planning and XR/VR training for safer, more efficient operations.



TOPSIDE & OFFSHORE OPERATIONS

Detect liquid and gas leaks, operate valves/actuators/controllers, monitor tank levels/equipment, and support emergency response, leveraging advanced simulations and models (with CFD and FEMA tools).



END-TO-END OPERATIONAL INTELLIGENCE

Robots feed digital twins and AI systems for predictive maintenance, process optimization, and fully autonomous workflows.



ADVANCED SENSOR INTEGRATION

AI-powered sensors provide real-time monitoring of anomalies and hazards, enhancing operational safety.



PREDICTIVE MAINTENANCE

Early issue detection minimizes downtime, extends equipment life, and reduces reliance on costly manual inspections.



COLLABORATIVE & MODULAR AUTOMATION

Humanoids, drones, and modular robots work safely with humans and can be redeployed for multiple tasks.

VALUE WE DELIVER

1

Autonomous Inspections: Drones and crawlers inspect tanks, monitor systems, and detect leaks and corrosion.

3

Enhanced Visibility: Sensor-equipped robots and digital twins provide real-time insights for safety and optimization.

2

Predictive Maintenance: AI-enabled robots detect anomalies early, reducing downtime and costs.

4

Scalable Automation: Modular autonomous systems, including drones and humanoids, are tested in simulations before deployment.

BUSINESS IMPACT*

Up to
30%

faster inspections with drones, subsea robots and topside crawlers

Up to
25%

lower operational costs by replacing helicopters, boats and manual work with robotics

Up to
20%

improvement in overall schedule adherence through constraint-aware planning

*All performance estimates are based on benchmark studies, pilot data, and industry-validated robotics use cases



ROBOTICS & PHYSICAL AI CAPABILITIES IN OIL & GAS

MOBILE ROBOTS & HUMANOIDS

Autonomous drones, crawlers, and humanoids perform inspections, valve operations, pipeline monitoring, and emergency response offshore and onshore.

AUTONOMOUS VEHICLES & NAVIGATION

Surface, subsea, and aerial robots use 3D mapping, obstacle avoidance, and motion planning to enable inspections, predictive maintenance, and monitoring.

SMART FACILITIES & INTELLIGENT WORKSPACES

AI, robotics, and digital twins enable autonomous monitoring, optimize asset and energy performance, and improve safety and operations in facilities.

AI-DRIVEN PERCEPTION & SENSOR FUSION

Multi-sensor fusion (gas imaging, infrared, LiDAR, radar) with AI and vision enables precise leak detection, corrosion monitoring, and anomaly detection.

HIGH FIDELITY SIMULATIONS & DIGITAL TWINS

High-fidelity simulations and digital twins model platforms and pipelines to test inspections and emergency scenarios, reducing operational risks.

INDUSTRIAL ROBOTICS & HUMAN-ROBOT OPS

Humanoids, legged robots, and robotic arms assist with maintenance, emergency response, and repetitive inspections, improving safety in hazardous areas.

ROBOTIC OPERATIONS & FLEET INTEGRATION

Connected robots across onshore, offshore, and subsea sites enable coordinated inspections and monitoring with cloud fleet management for efficiency.

EDGE AI & REAL-TIME DECISION MAKING

Onboard Edge AI enables autonomous intervention and real-time decisions in high-risk or low-connectivity environments, ensuring safe operations.



MATERIALS & RESOURCES

VIDEO

Physical AI-Driven Robotics Inspection For Oil & Gas Facilities

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WHITE PAPER

Transforming Oil & Gas Inspections With Physical AI Robotics

[Explore more →](#)

ABOUT SOFTSERVE

SoftServe is a digital engineering and technology consulting company specializing in AI, data, and cloud solutions. We decode complexities and reveal technology's full potential to rapidly unlock new possibilities for businesses, industries, and the communities they serve. Our global expertise is anchored in local understanding. From strategy to execution, we elevate technology into a force for growth, progress, and lasting impact.

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Ready to bring robotics & advanced automation to oil & gas operations?

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