Service at
the speed of
conversation

Instant, mission-critical
decisioning with Industrial AI™

IFS.ai

Service today is mission-critical.

But not all artificial intelligence is created equal.

We can't look anywhere without hearing about the game-changing implications of artificial intelligence (AI). But outside of consumer and professional use cases, largely leveraging Large Language Models, industrial AI is on a very different, much broader journey.

For example, dynamically scheduling service, maintenance and repair for critical infrastructure or production environments, or automating highly complex production processes, demands a completely different mindset: putting customers at risk is not an option. In the world of Service practice, safe, trusted, explainable decisioning is mission-critical.

This eBook examines how asset and service-focused companies can leverage the power of industrial AI, and the best-practice approaches that underpin it.

Decisioning and planning

Deliver instant, dynamic operational improvements.

The Service sector is especially dynamic and fast-moving. Day-to-day and hour-to-hour decisions can mean the difference between a customer's continued productivity or costly downtime. Industrial AI can minimize human touch points, driving automation. It can ensure technicians arrive on-site equipped with the knowledge, parts, and information they need to ensure a first-time fix.

AI-powered intelligent scheduling and optimization

Artificial intelligence (AI) is a powerful enabling technology. It can help to improve processes including demand forecasting, predictive maintenance, and scheduling optimization.

For example, by dynamically adapting schedules to changes in real time, AI-enabled scheduling optimization can automatically optimize plans and work schedules to improve decision-making, efficiency, customer response times, and more. It provides the flexibility to combine multiple planning algorithms and allows human schedulers to focus on priority exception and escalation cases.
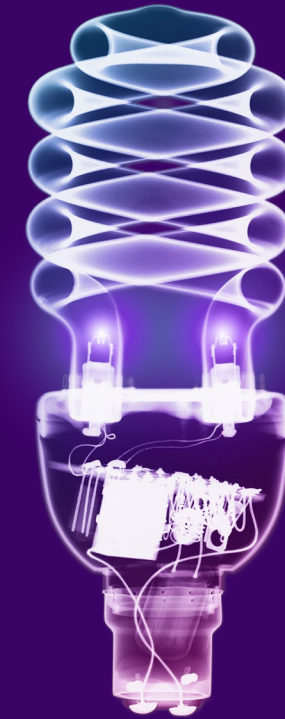
Formulate well-informed, long-term horizon strategic goals.

Equally, long term strategic planning demands assessing the known alongside uncertainty. Industrial AI copilots can extrapolate and model complex projections, for example the financial implications of staff costs, the management and maintenance of assets, or future opportunities to improve asset performance.

AI-enabled Asset Performance Management

Advances in data capture, modelling, and visualization, coupled with industrial AI, are fueling automation and Asset Performance Management (APM). Historically, Enterprise Asset Management (EAM) systems have allowed tracking, planning and maintenance of enterprise assets, leveraging data like location information, maintenance schedules, and work order history.

Now, using APM powered by industrial AI, this data allows organizations to de-risk their maintenance processes and operations by understanding how each asset is performing. APM insights can inform repair vs. replace decisions through the lifecycle, removing unnecessary maintenance from purely calendar-based regimes.

By knowing the health of an asset, companies can schedule condition-based or predictive maintenance when needed, as opposed to relying only on costly (and often not necessary) fixed calendar-based regimes. APM can also reduce inventory levels by optimizing spare parts stocking decisions ('just in case' vs just in time), indicating when and which parts are most likely to be needed based on the condition of the asset fleet.

Industrial AI

Making predictive maintenance a reality...
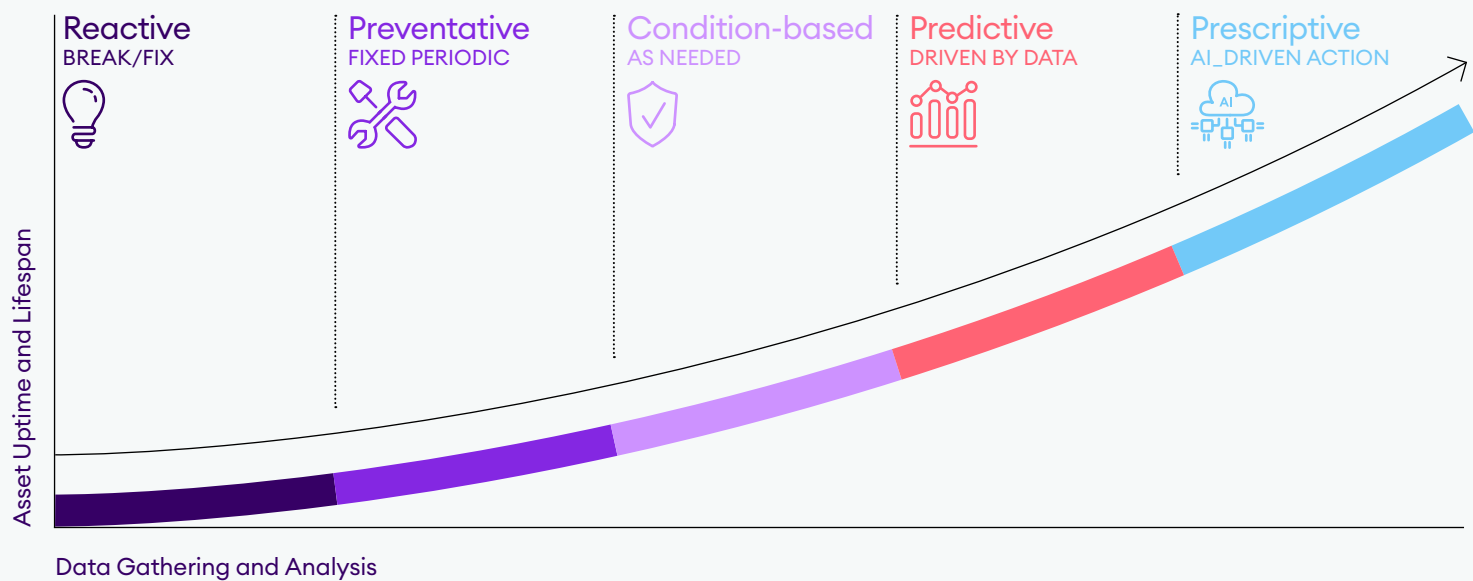
Delivering outcome-based service.

The need for AI-enabled resource orchestration.

A successful service visit demands orchestration which can be complex. A suitably-skilled technician, in the right place, at the agreed time; timely access to the right spare part, pre-ordered based on lead times from a supplier, and shipped to the local depot or customer location; perhaps subcontractor services to provide safe work at height access or specialist tools; and technical documentation or expert remote support for the field service operative to diagnose and repair the fault ideally on the first visit.

That orchestration also extends to enhancing the customer experience and outcomes with powerful self-service options. Intelligent AI-powered copilots can help to deliver outcome-based service at the speed of conversation.

The evolution of predictive maintenance

Reactive BREAK/FIX	**Preventative** FIXED PERIODIC	**Condition-based** AS NEEDED	**Predictive** DRIVEN BY DATA	**Prescriptive** AI_DRIVEN ACTION

Asset Uptime and Lifespan

Data Gathering and Analysis

> **"** The net result of AI is to empower multiple stakeholders including technicians, subcontractors, parts suppliers, and customers alike throughout the service lifecycle.

Delivering outcome-based service.

Automating data-rich work orders.

Industrial AI provides a way to automatically generate data rich work orders for service visits that are highly focused. AI can capture and present real-time asset performance, the service history of the asset, the technician skills needed and orchestrate the provision of the parts required.

Providing technicians with issue and asset-specific contextual knowledge.

Once on-site, AI can provide technicians with powerful diagnostic tools and technical support to resolve faults and execute a fix.

The work order becomes an asset-specific prompt, allowing an industrial AI Large Language Model to intelligently parse and collate all relevant data, including making automated recommendations based on previous similar scenarios and resolutions, offering guided handholding for repair procedures, and removing the need for manual data entry to close out the visit.

In tandem, using voice, text or image searches from a smart mobile device, a technician can quickly surface relevant maintenance notes, records, documents, and past fixes.

The net result of AI is to empower multiple stakeholders including technicians, subcontractors, parts suppliers, and customers alike throughout the service lifecycle.
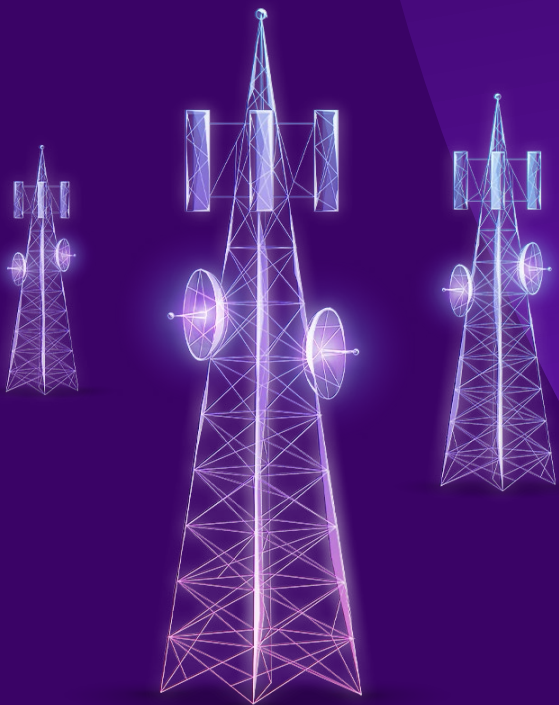
# Removing traditional barriers.

Industrial AI classes in service.

Content generation

Generative AI can provide value added content such as automatically populating a form or providing a response to a question. For instance, it can provide a summarized transcript of a service visit for the customer.

Serving recommendations

Using techniques such as multi-classification systems or clustering, AI can offer step-by-step recommendations to determine the best course of action towards a diagnosis and fix, i.e., "for the best chance of a first-time fix, add part x and part y."
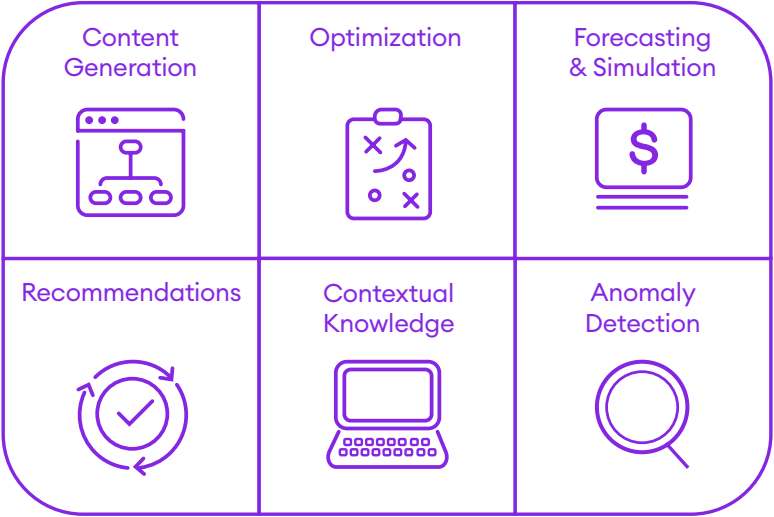
Contextual knowledge

AI can select knowledge from an entire data estate, including structured and unstructured data. By using advanced search capabilities to find relevant sources of data, and large language models to present the information, knowledge can be served based on a user's need context, or in response to a specific question. For example, it can automatically present a step-by-step guided resolution procedure to the technician based on a given set of facts and symptoms.

Optimization

AI at scale can perform compute-intensive operations at the speed of conversation. Consider for example, providing appointment slots in real-time via a self-service portal, assessing factors such as skills, certifications, proficiency, travel time, spare part availability and customer priority. And doing all of this based on achieving optimal value across the network with competing demands.

Event forecasting and simulation

Another component of AI is the ability to improve forecasting over longer periods via time-series analysis. This can dramatically improve skill and accuracy. By leveraging these time-series models, AI can find patterns in data and extrapolate them forward to predict future events. More complex scenarios can be run multiple times using AI-based simulation, in order to give the best answers to "what if" questions such as where best to place resources to fulfil expected new work.
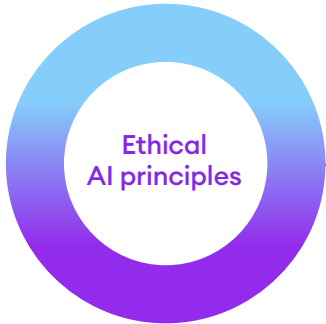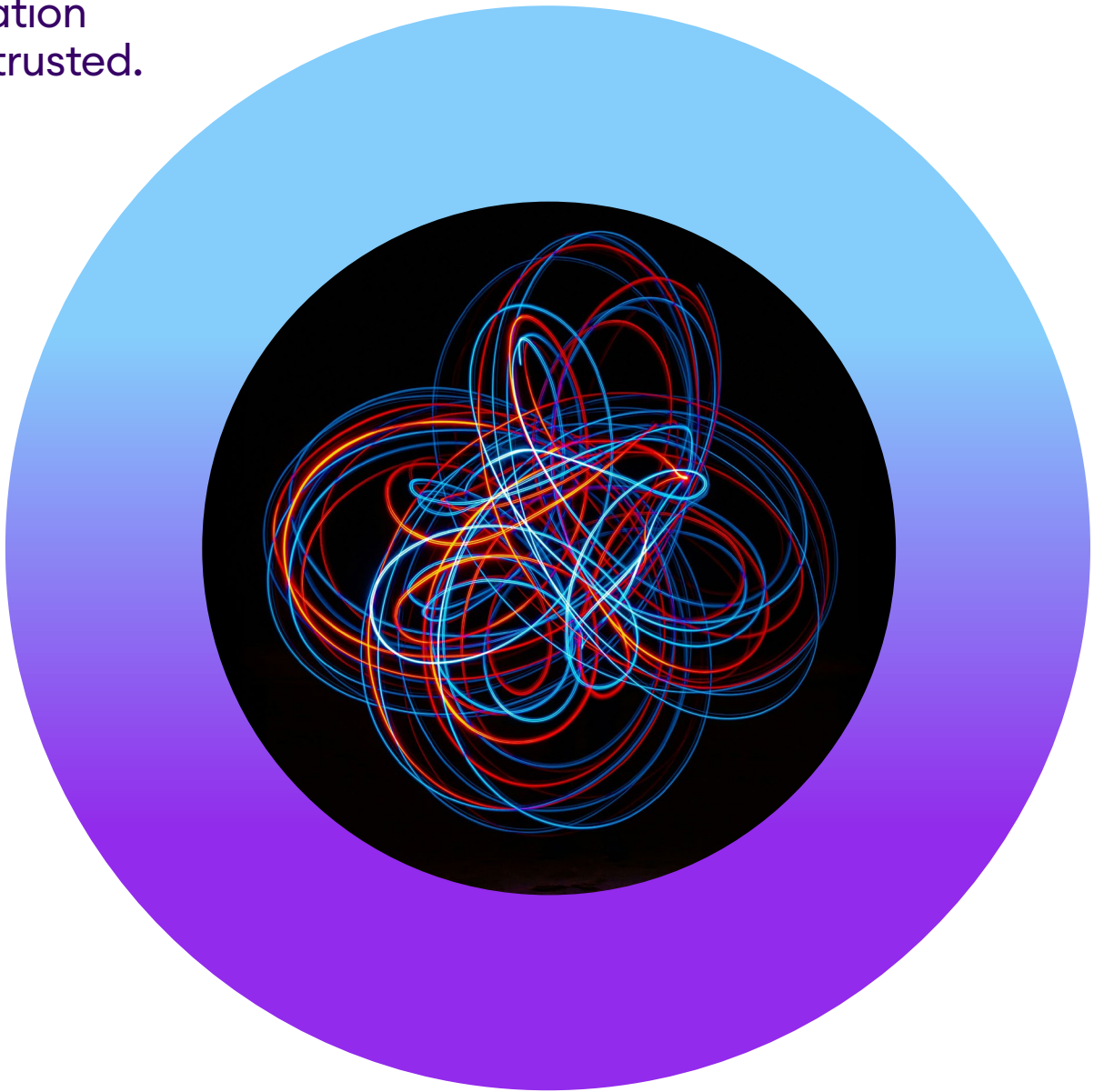
Anomaly detection

AI can detect and report anomalies without human intervention. By 'learning' what normal operation looks like, the AI model can self-calibrate to be able to recognize abnormal events and outliers, informing recommendations and decisions. All without the need for data scientists. One example could be expense anomaly detection to flag unusual spending patterns in real-time.

Explainability. XAI

Ensuring AI automation is responsible and trusted.

Ethical AI principles →

Transparency
Provide clear explanations of AI systems and their decision-making processes.

Fairness
Ensure AI systems do not discriminate and treat all individuals and groups fairly.

Accountability
Establish mechanisms for accountability when AI systems make decisions or take actions.

Privacy
Respect user privacy and protect sensitive information in accordance with regulations.

Responsible AI refers to the ethical and fair development, deployment, and use of artificial intelligence technologies. It is crucial for building trust and ensuring the positive impact of artificial intelligence on society.

Unlike mass market consumer generative AI LLMs and chatbots, mission-critical industrial AI is engineered to substantially reduce the risk associated with hallucinations.

While looking inside the models themselves is too complex for a human to understand, XAI techniques are designed to share the broad rationale and logic behind the digital decision-making by machine learning algorithms. Making these models available for scrutiny supports a continuous improvement (CI) mentality.

Most importantly, explainable AI engenders trust and accountability for AI-generated decisions and recommendations. For example, AI can very effectively automate Planning and Scheduling Optimization (PSO) to drive down costs, increase efficiency and throughput, and even fuel growth in field service. Using an AI powered dynamic scheduling engine, service job allocations and routes are constantly updated in-real time throughout the day, based on the very latest data.

By introducing a schedule explainability service for PSO, human dispatchers and technicians alike can see why the system is making certain decisions and, if necessary, offer input to improve them further.

Industrial AI for Service Industries: Key sector themes

Technician Enablement such as a guided resolution path, parts recommendations and auto-curated knowledge articles
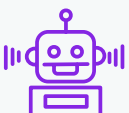
Intelligent Service: Predictive Duration, Predictive First-Time fix Probability, Predictive Parts, Predictive Failure, Predictive.X.

Fully Autonomous scheduling parameters (incl. Crew Recommendations, Overtime, Subcontract, etc.)

Copilot for Customer Self-service (Quote, Service Catalog, Requests,Up-sell/ X-sell, etc.) [App]

Copilot Recommendations: Contract Anomalies, Up-selling services, Up-skilling Technicians, Leverage Subcontractors, Modify SLAs

Industrial AI decisioning at work

> **"** By dynamically scheduling and monitoring service tasks over time, AI-enabled PSO can learn engineer proficiency and recommend experience needed for different tasks.

Planning and Scheduling Optimization (PSO)

By dynamically scheduling and monitoring service tasks over time, AI-enabled PSO can learn engineer proficiency and recommend experience needed for different tasks. This intelligence can, for example, shape the way future jobs are planned and allocated. By calculating accurate durations for a particular service or repair, and what percentage of cases result in a first-time fix, schedules can be optimized accordingly. The same insight can also help to inform and enable individually tailored pricing levels for different SLAs and clients.

Anomaly detection – Asset Performance Management (APM)

Anomaly detection models can automatically learn normal asset behavior based on time-series data generated by the asset. With just a short setup time streaming such data, AI algorithms use sophisticated techniques to predict and identify anomalies for investigation.

By leveraging sensors and analytics to project the wear and degradation of assets, critical changes in performance or even failures can be predicted before they can occur. Anomaly detection follows a prescriptive approach, automatically triggering recommended service actions based on the severity of the alert.

Predictive Task Duration

Utilizing historical records, machine learning-based predictive task duration can recommend optimal run-times for work tasks, improving resource planning efficiency. By factoring multiple parameters together to offer precise suggestions, it helps dispatchers to plan tasks efficiently with a fully utilized resource plan, optimizing resource allocation and scheduling.

'What If' Scenario Explorer (WISE)

WISE is an advanced AI-enabled planning tool for organizations with a mobile workforce. By projecting likely outcomes to 'what if' scenarios, service organizations can test ideas thoroughly before committing to a course of action to minimize risk and maximize profits.

WISE can help to plan the number of resources needed, what skills they should have, and where they should be deployed. It can also calculate the business KPIs that they can expect to achieve – for example, possible savings in subcontractor outsourcing costs available by optimizing internal resource allocation. Thus, enabling fact-based decisioning where AI is augmenting the human.

Customer value enhanced by AI-driven optimization

35%
reduction in drive time

300%
increase in technicians-dispatchers ratio

76%
lower average cost per job

49%
decrease in subtractor spend*

*Source: www.ifs.com/assets/enterprise-service-management/ifs-planning-and-scheduling-optimization

Find out more

IFS.ai is Industrial AI, transforming service and asset centric organizations. Whether that is optimizing your field workforce, driving customer self-service, empowering the technician, transitioning to predictive and prescriptive maintenance models or augmenting your workforce to make better decisions. Does your service solution allow you to operate at the speed of conversation?

To learn more, and continue the conversation, visit IFS.ai

Disclaimer: The scenarios and technologies discussed in this eBook are meant to illustrate potential future directions in AI. They do not reflect any official plans or roadmap commitments by IFS.

About IFS

IFS develops and delivers cloud enterprise software for companies around the world who manufacture and distribute goods, build and maintain assets, and manage service-focused operations. Within our single platform, our industry specific products are innately connected to a single data model and use embedded digital innovation so that our customers can be their best when it really matters to their customers – at the Moment of Service™. The industry expertise of our people and of our growing ecosystem, together with a commitment to deliver value at every single step, has made IFS a recognized leader and the most recommended supplier in our sector. Our global team of over 6,000 employees every day live our values of agility, trustworthiness and collaboration in how we support thousands of customers. Learn more about how our enterprise software solutions can help your business today at ifs.com

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