

Case Study

Designed a Scalable Digital Inspection Platform for Robotics, IoT and AI-driven Asset Intelligence



Customer Overview



Customer

A global industrial services organization developing a next-generation digital inspection platform powered by robotics, IoT, and data intelligence.



Industry

Industrial Services | Oil & Gas | Asset Integrity



Profile

The customer provides industrial inspection and asset integrity services across complex operating environments, including oil & gas and industrial infrastructure.



Services

Product Discovery & Strategy | Digital Product Engineering | UX/UI Design | IoT & Robotics Integration Strategy | Data & Cloud Architecture | AI Strategy | Security & Compliance Architecture

Business Need

The customer envisioned a scalable digital inspection ecosystem capable of connecting field inspections, robotic equipment, IoT sensors, inspection data, human expertise, and customer-facing insights. With early concepts already developed, the organization needed to validate the product vision and establish a clear functional and technical blueprint before moving into full-scale development.

- **Complex Inspection Ecosystem** - The platform needed to support robotic crawlers and diverse inspection technologies, including cameras, ultrasonic scanning, X-ray equipment, and future sensor types.
- **Disconnected Inspection Data** - Different inspection tools generated different data formats, requiring a scalable approach to capture, structure, and manage inspection evidence and sensor readings.
- **Challenging Field Conditions** - Field inspectors required an intuitive, tablet-based experience capable of operating offline in rugged environments with limited or no connectivity.
- **Scalable & Secure Architecture** - The solution needed flexible roles and permissions, secure customer access, tenant separation, and support for regional privacy and data-residency requirements.
- **Future AI Readiness** - The customer needed a data strategy that could progressively support anomaly detection, trend analysis, asset-condition intelligence, and predictive maintenance.



Solution and Approach – Product & Experience Discovery

Synoptek conducted a collaborative discovery engagement spanning functional, UX, data, security, and technical workstreams. The team transformed early product concepts into a structured blueprint defining how users, devices, inspection workflows, and data could work together across the inspection lifecycle.

End-to-End Inspection Workflow

- Defined the inspection lifecycle across planning, field execution, data capture, review, reporting, and closure.
- Established personas and responsibilities for planners, supervisors, field inspectors, reviewers, administrators, account managers, and customers.
- Created a reusable, template-driven inspection model for procedures, equipment, evidence, sensor types, and operational instructions.

Field Experience & Offline Operations

- Designed a focused tablet experience specifically for industrial field users.
- Established an offline-first operating model, allowing inspectors to synchronize assignments before entering the field, capture data locally, and synchronize results when connectivity becomes available.
- Considered rugged devices, gloves, limited screen interaction, and guided inspection procedures in the UX direction.

UX & Product Design

- Developed concept-level wireframes and UX flows for login, dashboards, inspection planning and execution, scheduling, navigation, and customer interactions.
- Defined role-specific experiences across the internal web platform, field tablet application, and customer-facing portal.
- Established design direction for dashboards, global search, quick actions, inspection status, and scheduling.

Solution and Approach – Technology, Data & AI Foundation

Synoptek designed the platform direction to remain flexible as inspection technologies evolve, avoiding dependency on a single robotic device or sensor type while establishing the data foundation required for future intelligence.

Robotics & IoT Integration

- Defined an extensible integration approach for robotic crawlers, cameras, ultrasonic devices, X-ray equipment, and future sensor technologies.
- Explored a local communication layer connecting field tablets, robotic equipment, sensors, and local storage.
- Structured the capture of images, video, sensor readings, equipment status, location information, observations, anomalies, and supporting evidence.

Data, Insights & Reporting

- Defined a structured inspection data model to create consistency across assets, inspections, findings, evidence, and historical records.
- Established a foundation for comparing historical inspection results to identify deterioration, recurring anomalies, and asset-condition trends.
- Defined automated inspection reporting to translate complex field and sensor data into meaningful customer findings and recommendations.



Solution and Approach – Technology, Data & AI Foundation

Data-First AI Roadmap

Rather than making AI a dependency for the initial platform, Synoptek defined a pragmatic roadmap beginning with human-reviewed and manually classified inspection data to create a trusted dataset.

The roadmap enables progression toward:

Anomaly Detection → AI-Assisted Review → Sensor-Specific AI
→ Trend Analysis → Asset Condition Intelligence → Predictive Maintenance

Security & Regional Architecture

- Defined role- and permission-based access and secure organizational authentication.
- Separated internal operational workflows from customer-facing access.
- Established customer- and asset-level access controls.
- Addressed inspection media storage, synchronization, GDPR, and regional data-residency requirements.
- Considered separate regional environments where required to protect sensitive customer and inspection data.



Future-Ready Inspection Intelligence

A progressive roadmap to transform raw field inspection data into intelligent insights and predictive outcomes.



From Data to Intelligence. From Insights to Impact.

A unified platform for safer operations, smarter decisions and a more reliable future.

Business Benefits

The discovery engagement transformed an evolving combination of robotics, IoT, inspection hardware, software, and data concepts into a validated digital product blueprint, providing the customer with greater clarity and a structured path toward implementation.

Established a unified product vision connecting robotics, IoT, field inspection workflows, data management, reporting, and future AI capabilities.

Defined the complete inspection lifecycle from customer and asset setup through planning, field execution, review, reporting, delivery, and follow-up inspections.

Established offline-first field operations to support inspections in remote and connectivity-constrained industrial environments.

Built the foundation for data-driven asset intelligence by structuring inspection evidence and sensor outputs for future trend analysis, anomaly intelligence, and asset-condition insights.

Created an implementation-ready UX direction with validated user journeys and concept-level wireframes tailored to office, field, and customer users.

Designed a scalable device integration approach capable of supporting robotic crawlers, cameras, ultrasonic equipment, X-ray tools, and future sensor technologies without being tied to a single device.

Defined a pragmatic AI roadmap that allows the organization to build trusted inspection datasets before progressing toward AI-assisted analysis and predictive maintenance.

Reduced implementation risk and improved roadmap clarity by identifying security, privacy, data residency, device integration, MVP requirements, and future innovation opportunities before full-scale development.

About Synoptek

Synoptek is the first IT Managed Experience Provider (MxP™), delivering AI-enabled automation, strategic modernization, and experience-led outcomes. Its services span Cloud and Agile Infrastructure, Business Applications and Platform Development, Customer and Employee Experience, and Cybersecurity. With a business-first approach and a global delivery model, Synoptek helps organizations optimize operations, accelerate transformation, and achieve measurable results—guided by a culture rooted in growth, ownership, inclusiveness, and philanthropy.



Pacific Arts Plaza, 611 Anton Blvd., Suite #925,
Costa Mesa, CA 92626



303-728 3335



salesinquiries@synoptek.com



www.synoptek.com

