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ADI OtoSense™ INSIGHTS

ADI OtoSense SMS Helps Nissei's Factory DX Initiative

Nissei uses Analog Devices smart motor for predictive maintenance of the homogenizers at the Lake Biwa Plant. The smart motor sensor collects data on motor vibration, temperatire and magnetic flux and uses AI to analyze the data. This analysis provides a clear view of the state of the motor, performing optimized diangostics for each individual units.

Nissei Co. and ADI OtoSense Insights: Revolutionizing Soft Serve Ice Cream Production with AI-Powered Predictive Analytics

ADI OtoSense™ Insights Smart Motor Sensor (SMS) Enables Predictive Maintenance Insights at Nissei Facility

In the current age of industrial innovation, the ADI Otosense Insights Smart Motor Sensor solution stands as a beacon of transformation, reshaping the landscape of operations at Nissei Co., a cherished icon in Japan's soft serve ice cream industry. This partnership vividly illustrates ADI's unwavering commitment to empowering the manufacturing sector with the predictive analytics prowess, ultimately fostering a culture of enhanced efficiency and innovation at Nissei's Lake Biwa facility located in the picturesque Shiga Prefecture.

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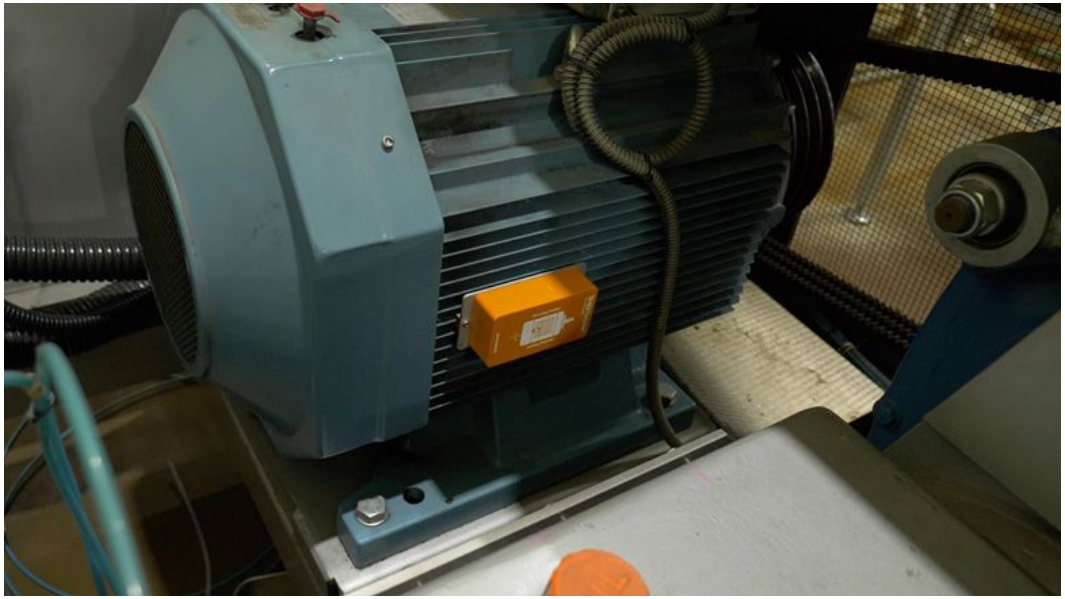
Motor Meltdown: Revolutionizing Maintenance With AI Insights

In the face of unexpected breakdowns, Nissei Co. was thrust into a critical test, safeguarding the soul of Japan's adored soft serve ice cream. The stakes were high as a single falter in their homogenizer didn't just stall, but risked the very essence of their craft, exerting immense pressure on resources. It was the deployment of ADI OtoSense Insights Smart Motor Sensor (SMS) that turned the tides. This beacon of AI-driven predictive analytics illuminated the path to stability, pre-empting pitfalls, and securing an unbroken stream of production. The ripple effect was profound: relentless production, slashed costs from downtime, and the unwavering delivery of Nissei's exceptional soft serve.



Operational Excellence Through AI-Driven Proactivity

Nissei's pre-AI era was marked by inefficiency, with malfunctioning equipment leading to costly, abrupt production stops and wastage. The adoption of ADI OtoSense Insights Smart Motor Sensor (SMS) was transformational, turning reactive measures into

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a proactive strategy that significantly boosted reliability and throughput of the production line. The emulsification process's success hinges on precise temperature control—a homogenizer failure meant not just a pause, but a complete operational freeze, necessitating discards of in-process product.

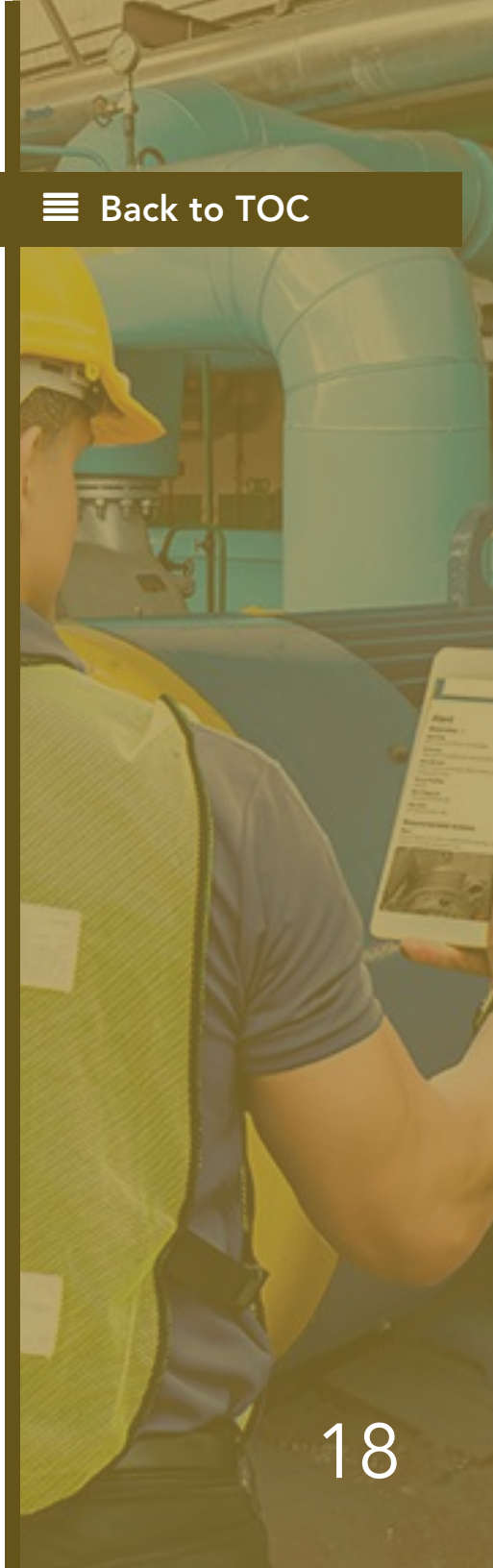
"Emulsification is a critical process in the production of soft serve ice cream mix. If a problem happens with the homogenizer, emulsification is impossible, and the quality of the product cannot be properly maintained."

ADI OtoSense Insights SMS' AI-driven vigilance over temperature, vibration, and magnetic flux preemptively spots and addresses potential faults, preventing interruptions or quality lapses. By comparing real-time data to a 'digital normal,' the system proactively signals deviations, prompting immediate corrective action. This predictive approach reduces wastage, ensures uninterrupted production, and preserves product excellence—factors that are instrumental in fortifying Nissei's market position and operational superiority.

AT A GLANCE

GOAL

To elevate operational dependability and efficiency at Nissei, our objective is to diminish unforeseen equipment breakdowns and curtail food wastage. This goal is to be achieved through the seamless integration of ADI OtoSense Insights Smart Motor Sensor (SMS) for predictive maintenance.



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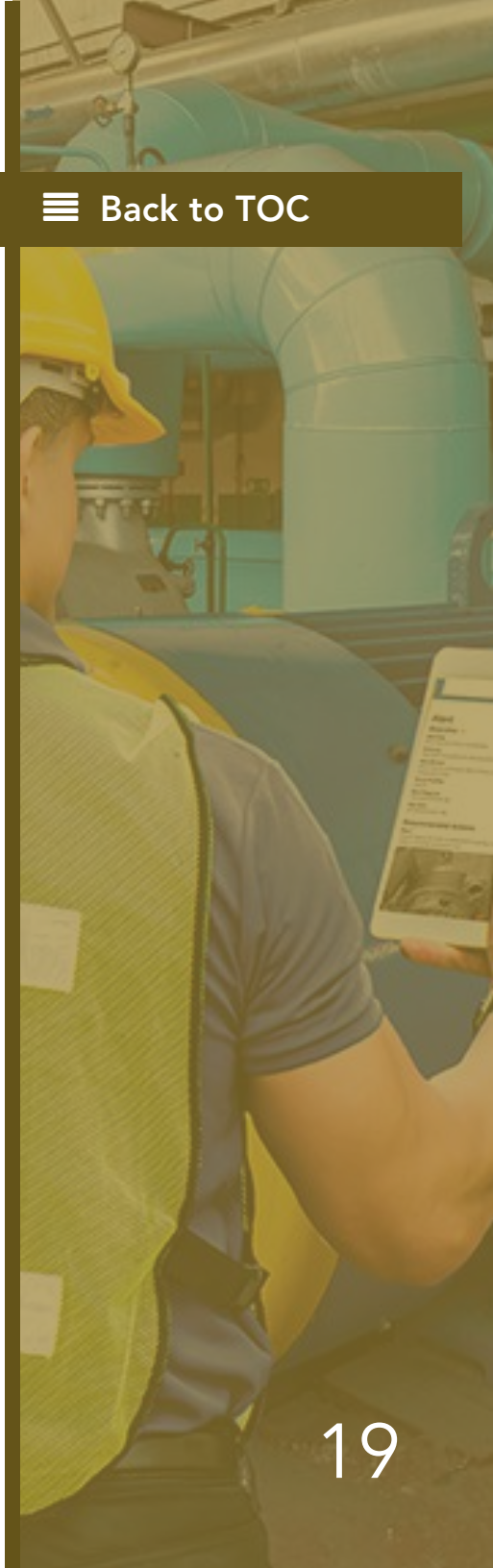
CHALLENGES

- **Early Issue Detection:** ADI OtoSense Insights Smart Motor Sensor (SMS) excels at identifying potential issues at an early stage, allowing for proactive intervention to prevent unscheduled downtime. While traditional indicators like temperature and vibration anomalies can serve as precursors to imminent failure, ADI OtoSense Insights SMS takes early intervention to the next level by comparing real-world data to an AI model of the system in its optimal operational state. This advanced approach ensures that problems are addressed well before they escalate, effectively averting operational disruptions.

- **Technician Liberation:** In a factory setting, expecting experienced technicians to maintain constant 24/7 vigilance, searching for minute mechanical issues, is neither practical nor efficient. Here's where the ADI OtoSense Insights SMS truly shines—by harnessing the power of artificial intelligence (AI) to autonomously detect anomalies and provide actionable solutions. This groundbreaking capability not only enhances the efficiency of issue detection but also liberates technicians from the monotonous task of continuous monitoring. As a result, they can redirect their expertise towards resolving identified issues promptly and effectively, contributing significantly to overall operational excellence.

- **Comprehensive Network Monitoring:** Within the expansive and intricate factory floor environment, an ideal solution should possess the capability to comprehensively monitor the entire network of machines. Furthermore, it should deliver real-time insights or with minimal delay, enabling swift corrective action. The ADI OtoSense Insights SMS is purpose-built to meet this exact requirement. Seamlessly integrating with the factory's machinery network, it provides timely and actionable



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insights that empower decision-makers to proactively address potential challenges. This holistic approach to machine network monitoring ensures that the entire production ecosystem operates at peak efficiency, minimizing disruptions, and maximizing productivity.

APPLICATION

ADI OtoSense Insights SMS helps continuously monitor homogenizers at Nissei's Lake Biwa factory, so Nissei can take a proactive approach to maintenance and ensure efficient, high-quality production of its product.

OUTCOME

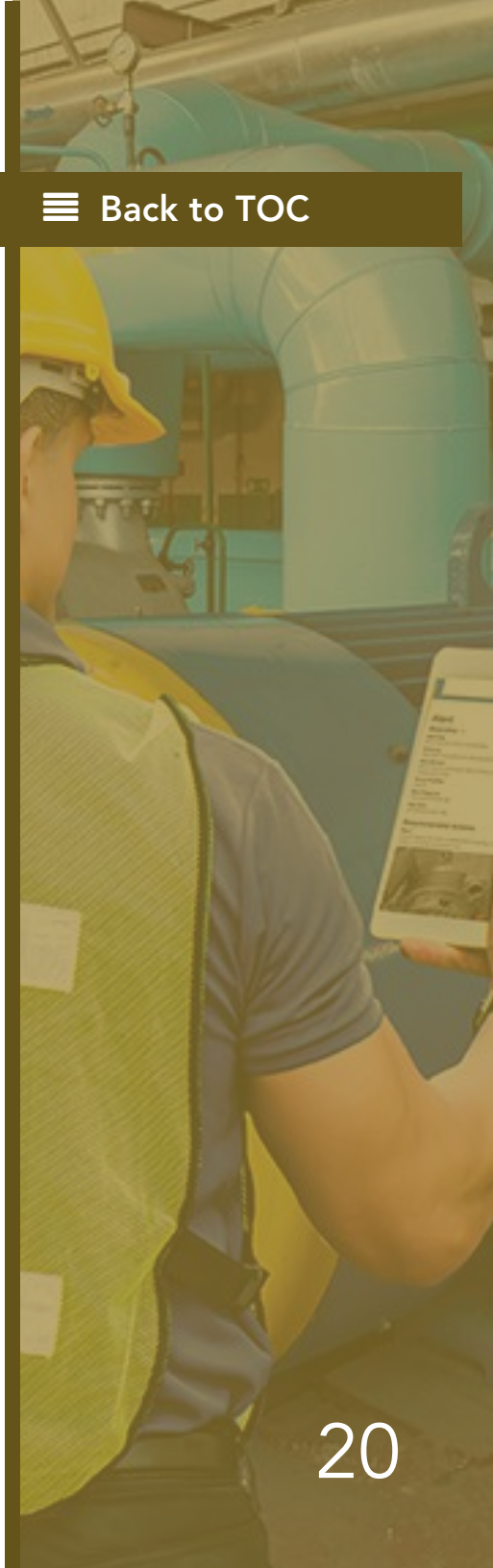
- **Enhanced Efficiency:** Significantly boosted critical machinery uptime and continuous motor monitoring for peak performance, resulting in a substantial reduction in downtime.

- **Predictive Maintenance:** Implementing a proactive maintenance approach to prevent expensive breakdowns.

- **Scalable Innovation:** Embracing evolving solutions that seamlessly expand with business growth, ensuring the integration of the latest technology.

Legacy Meets Innovation: Nissei's AI Revolution In Industry Comparison

Since its inception in 1951, Nissei has not only introduced Japan to the delight of soft serve ice cream but has continually sought innovation to perfect production. This legacy of pioneering advancements found its latest expression in the integration of ADI



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OtoSense AI technology. Where the industry typically leans on conventional methods, Nissei stands apart, embracing AI to predict and prevent machine failure. This foresight positions Nissei not just as an ice cream favorite but as a vanguard in technological adoption, setting new efficiency benchmarks for the food production industry.

Advantages Of Smart Motor Sensor Installation In The Food Market

ADI OtoSense Insights Smart Motor Sensor (SMS) provides real-time monitoring of motor health in equipment such as pumps, mixers, chillers, compressors, and centrifugal machines that are essential in the food manufacturing process. As soon as the motor shows any sign of wear or potential fault, ADI OtoSense Insights SMS sends an alert to initiate predictive maintenance. AI-generated insights into the issue's origin and severity further support strategic decision-making around maintenance and repairs.

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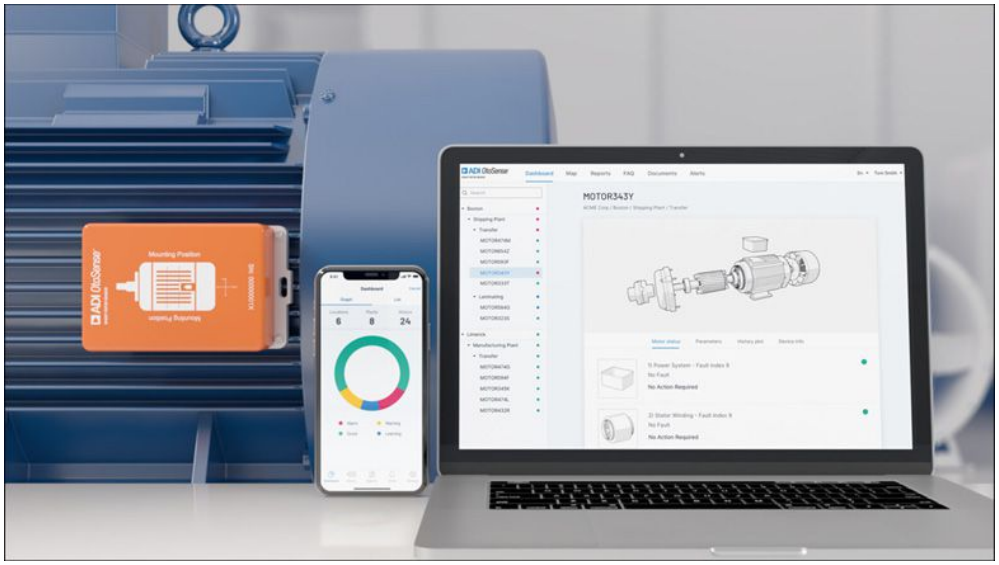
Future Implications In The Food Industry:

Nissei's success with AI predictive analytics paves the way for broader applications in the food industry. This technology can be adapted to various production lines, ensuring quality control and efficiency, and setting a new standard for operational excellence in the sector.

Benefits Of ADI Otosense Insights SMS For Nisse

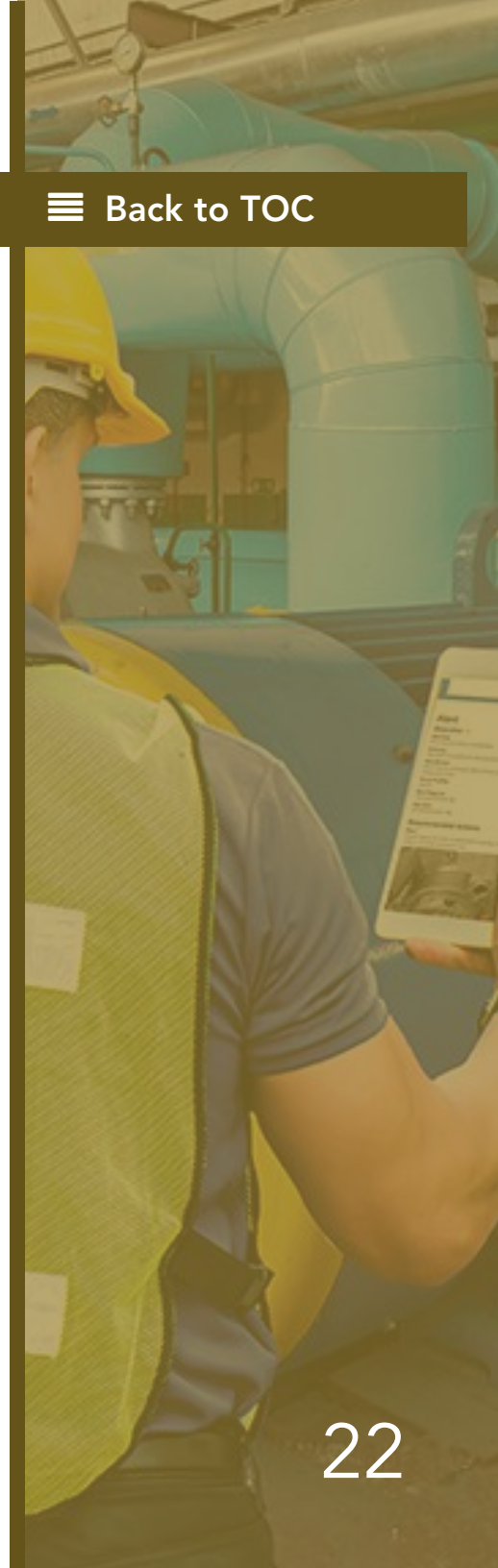
"The UI/UX system is clearly illustrated and color-coded so that even first-time users can intuitively understand it," as quoted by Nissei Technician



Implementing ADI Otosense Insights Smart Motor Sensor (SMS) solution, Nissei has seen substantial improvements. Early detection and intervention capabilities have minimized downtime, aligning with our commitment to transforming data into actionable intelligence for operational excellence.

1. Early Detection, Early Intervention

a. Some smart motor sensors detect temperature anomalies. Others detect unusual vibrations. ADI OtoSense Insights SMS detects both, as well as magnetic



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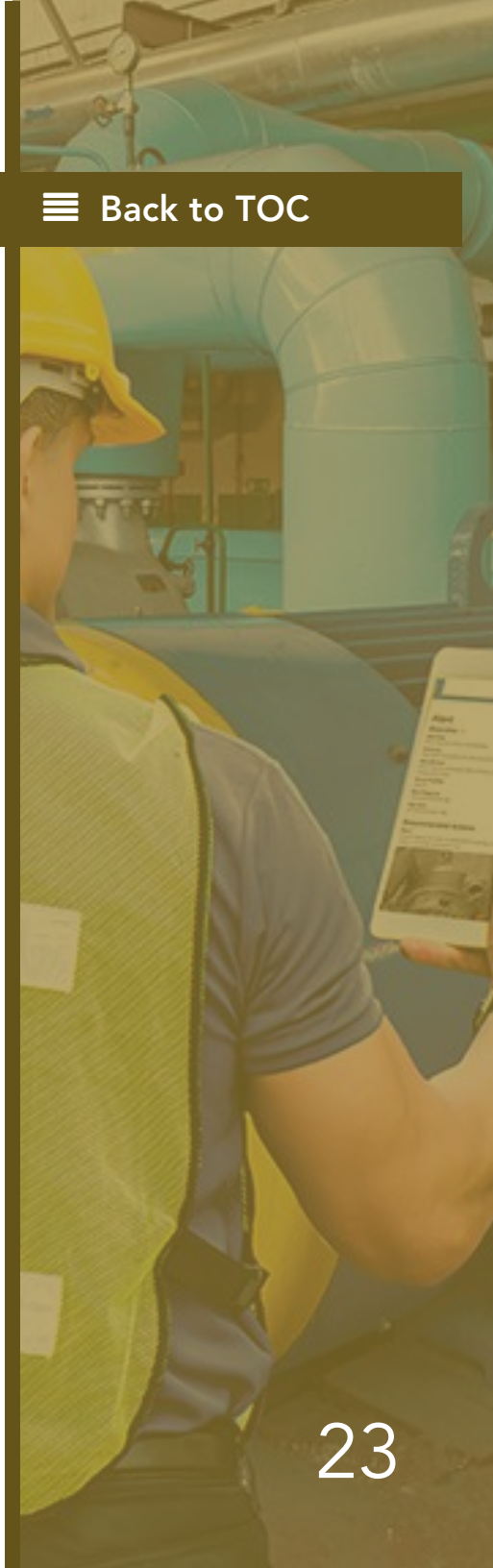
flux, which is often an earlier warning sign of potential motor failure. Artificial intelligence enables ADI OtoSense Insights SMS to detect more subtle anomalies in real-time performance, enabling earlier intervention.

2. User-Friendliness

a. Nissei can check the status of its homogenizer(s) at any time on the ADI OtoSense Insights SMS dashboard, which offers a visual and intuitive UX/UI so that even first-timers can get started easily. The system AI checks real-time data against the system model, interprets the findings, generates insights, and prescribes corrective actions, eliminating the time and costs associated with hiring a dedicated data scientist.

3. Strategic Advantage

a. ADI OtoSense Insights SMS equipped Nissei with data to support maintenance and equipment contract negotiations. Nissei plans to optimize the frequency of maintenance to reduce future costs. For example, by planning maintenance around early detection of potential failures, many customers not only avoid unplanned downtime, but also see a reduction in unnecessary routine maintenance. This often results in gained time between equipment overhauls by only performing necessary maintenance and repairs.



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Yoshihiro Murakami of Nissei Co. Ltd. highlights the significance of this partnership, "Our collaboration with ADI Otosense Insights on the Smart Factory NISSEI project is pivotal for our digital transformation, enhancing safety and efficiency."

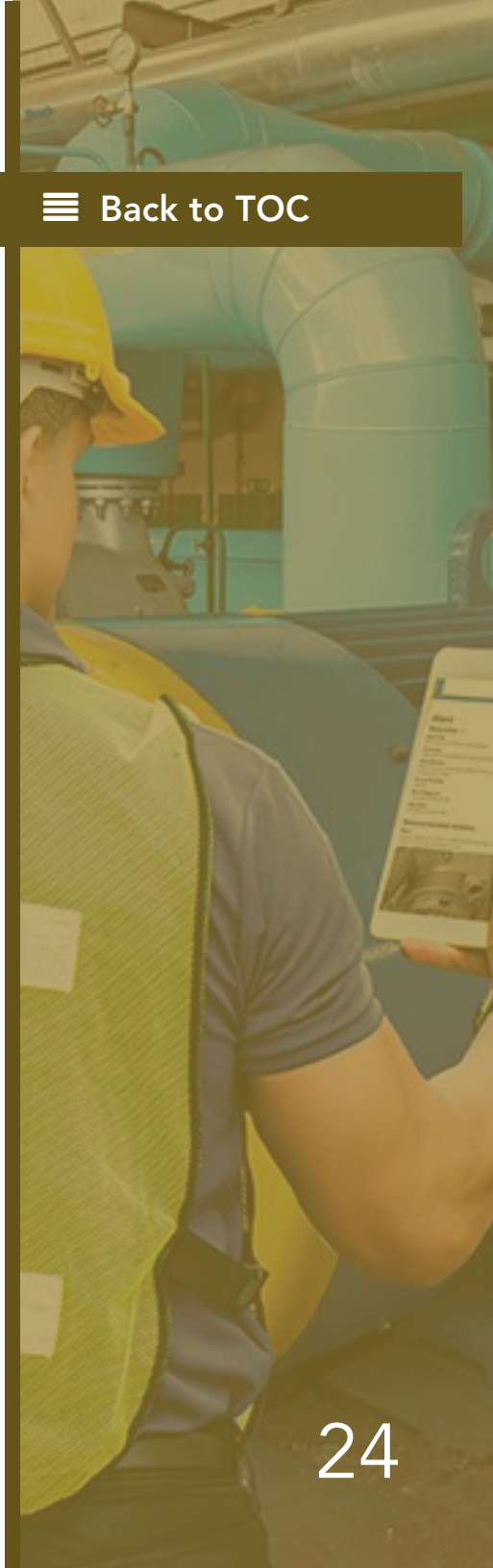
YOSHIHIRO MURAKAMI,
NISSEI CO. LTD.
Manager Presto Production Division

Case Studies And Testimonials:

Employees at Nissei have witnessed firsthand the benefits of the ADI OtoSense Insights SMS. One technician shared how the technology alerted them to a potential failure days before it would have occurred, enabling timely intervention and uninterrupted production. As quoted by Nissei technician, "The problem of homogenizer has a significant negative impact on production and labor costs, and raw materials would go waste.

ADI Otosense Insights SMS Capabilities:

- Advanced diagnostics for prioritized action items



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- Sensing technologies for high-quality data analysis
- AI with accelerated learning supports system modeling, anomaly detection and analysis, and solution generation for continuous improvement and reliability.
- Monitors mechanical and electrical signals, enabling it to detect multiple faults
- Reduces unforeseen downtimes and avoids catastrophic failures
- Increases equipment lifetime
- Optimizes motor efficiency and overall performance

CONCLUSION

This case study exemplifies ADI Otosense Insights' tagline, 'Insightful Manufacturing, Intelligent Decisions,' showcasing the transformative impact of ADI Otosense Insights' Smart Motor Sensor (SMS) solution in Nissei's production line. Our approach in enhancing operational efficiency and predictive maintenance at Nissei's ice cream factory showcases our commitment to technological innovation and client success. This partnership not only delivered significant productivity improvements but also highlighted our ability to meet and exceed industry challenges. By choosing to work with us, businesses are empowered to achieve a competitive edge and realize substantial advancements in their operations.