CUSTOMER SUCCESS STORY

Leading Tire Manufacturer Reduces Equipment Troubleshooting Time with C3 Generative AI

Value-Driven Benefits

90%
answer accuracy to troubleshoot issues

150+
acronyms and shorthand recognized

50%
estimated reduction in average time to repair downtime issues

Introduction

With over 125 years of history, a leading U.S.-based tire manufacturer is a global leader in producing high-performance tires for a wide range of industries, including passenger vehicles, commercial trucks, aviation, military, and heavy off-road machinery. With over $20 billion in annual revenue and a workforce of 70,000+ employees, the company operates 50+ manufacturing facilities across 20+ countries and maintains a vast network of over 1,000 auto and tire service centers. The company's success relies on the seamless operation of its manufacturing equipment, which plays a mission-critical role in production efficiency, quality control, and overall business continuity. Downtime in key manufacturing processes can result in production halts lasting over eight hours, causing significant financial and operational impacts. With millions of dollars in revenue at stake, reducing equipment failure and maintenance delays is essential to sustaining output levels, meeting customer demand, and maintaining competitive advantage. The company implemented AI-driven maintenance solutions, integrating 1,000+ documents and live SAP work order and spare parts data to streamline troubleshooting. This reduced machine downtime repair time by up to 50%, enhancing operational resilience and equipment uptime. By improving information retrieval and technician efficiency, the initiative became a strategic priority, minimizing costly disruptions and ensuring continuous production flow.

Challenges

The manufacturer experienced prolonged and costly equipment downtime, often exceeding eight hours, when troubleshooting critical tire manufacturing assets. These assets were mission-critical to production, directly impacting output, quality, and revenue. With millions of dollars at stake, any disruption in these processes led to financial losses, supply chain inefficiencies, and customer delays. The troubleshooting process was slow and highly manual, relying on technician experience, legacy knowledge, and fragmented documentation. Maintenance planners had to prioritize issues, while technicians spent valuable time parsing through disparate data sources such as work orders, equipment manuals, and technician notes to identify and resolve problems. Compounding this challenge, the company faced its highest technician attrition rate in over a century, further eroding institutional knowledge and increasing the risk of prolonged downtime. To maintain operational efficiency and ensure consistent, high-quality production, the manufacturer needed to modernize its maintenance and troubleshooting approach, enabling technicians to access critical insights faster, reduce repair times, and minimize revenue losses associated with unplanned downtime.

Solution

To address these challenges, the manufacturer implemented C3 Generative AI for Equipment Troubleshooting, an AI-driven application designed to streamline the review and analysis of troubleshooting documents. By leveraging large language models and enterprise data integration, the solution enabled technicians to quickly diagnose machinery issues, reducing the time spent searching through work orders, equipment manuals, and technician notes. C3 Generative AI for Equipment Troubleshooting ingested over 1,000 unstructured and structured data sources, including technician notes, equipment manuals, SAP work order data, and spare parts data. With instant access to critical insights through an intuitive search and chat interface, technicians could resolve equipment failures faster and more efficiently. This solution significantly reduced downtime in key processes, enabling improved production efficiency, enhanced technician productivity, and ensured consistent, high-quality tire manufacturing while minimizing financial losses associated with unplanned downtime.

Results

50% Reduction in Average Time to Repair Machine Downtime

The AI-powered solution streamlined troubleshooting and maintenance workflows, cutting the average repair time in half and minimizing costly production delays.

Improved Technician Efficiency and Knowledge Retention

With instant access to over 1,000 critical maintenance documents, including equipment manuals and technician notes, and connections to SAP Work Order and spare parts data, teams could resolve issues faster and reduce dependence on legacy knowledge, mitigating the impact of high attrition rates.

Inside the Digital Transformation

Over a three-month deployment, the manufacturer partnered with C3 AI to deploy the C3 Generative AI for Equipment Troubleshooting solution at one of its largest U.S.-based tire production facilities. The deployment focused on three of the five critical business processes and covered over 240 pieces of machinery essential to maintaining production continuity and quality.

The joint team began by integrating over 1,000 structured and unstructured data sources, including SAP PM work order data, technician notes, equipment manuals, and spare parts information. A custom document parser was configured to accurately extract and differentiate between text, tables, and images within complex technical documents, ensuring precise and context-aware information retrieval.

To enhance usability for technicians, the application was trained to recognize over 150 acronyms and shorthand terms commonly used in maintenance documentation. A live data connection to SAP enabled real-time access to work order data, while the intuitive search and chat interface allowed technicians to quickly surface relevant troubleshooting insights.

As technicians onboarded onto the application, the AI-powered system significantly reduced the time spent diagnosing equipment issues, enabling faster resolution and minimizing costly downtime. Onsite user acceptance testing at the end of the deployment confirmed measurable improvements in troubleshooting speed and technician efficiency. Feedback from operators and engineers was rapidly incorporated, refining the application to better meet user needs. The successful deployment demonstrated the potential of generative AI to enhance equipment reliability and technician productivity, laying the groundwork for future initiatives aimed at scaling AI-driven maintenance solutions across other high-impact areas of the manufacturing process.

Project Outcome

During the deployment, C3 Generative AI for Equipment Troubleshooting achieved 90% accuracy, enabling the manufacturer to troubleshoot more efficiently and reduce average time to repair downtime issues by an estimated 50%. This reduction in average time to repair machine downtime allowed technicians to spend less time diagnosing issues and focus on higher-value tasks, ultimately improving overall operational efficiency.

The solution covered over 240 pieces of machinery, supporting three of the five critical business processes at one of the largest tire manufacturing facilities in the United States. By providing instant access to structured and unstructured data sources, including SAP work order data, technician notes, equipment manuals, and spare parts data, the AI-powered system enhanced decision making, minimized downtime, and improved production continuity.

The successful deployment of C3 Generative AI for Equipment Troubleshooting demonstrated its significant impact on manufacturing productivity, technician efficiency, and overall equipment reliability.

Conclusion

The manufacturer conducted a three-month production deployment with C3 AI to reduce downtime, improve troubleshooting efficiency, and enhance technician productivity.

As part of the deployment, a custom document parser was configured to accurately differentiate between text, tables, and images within complex technical documents, ensuring precise information retrieval. A live data connection was established with SAP PM Work Order data, and 1,000+ unstructured documents were ingested, enabling access to equipment manuals, technician notes, and other documents critical to troubleshooting. The application was further enhanced to recognize 150+ acronyms and shorthand terms, improving search accuracy and usability for technicians.

Onsite user acceptance testing at the end of the deployment was well received, with operators and engineers confirming improvements in troubleshooting speed and efficiency. Key feedback was rapidly incorporated within a week, further refining the application for enterprise-wide deployment. The success of the deployment. demonstrated measurable business impact, with a projected 50% reduction in average time to repair machine downtime, and increased technician efficiency through instant access to over 1,000 maintenance documents and SAP work order data and spare parts data.

About the Company

- Leading U.S.-based tire manufacturer
- ~$20B in annual revenue
- Global customer base, operating in 55 manufacturing facilities in 20+ countries
- 72,000 employees worldwide
- Provides tires for a wide range of vehicles from motorcycles to RVs

Project Highlights

- Achieved 90% answer accuracy, ensuring confidence in AI-generated responses across 1,000+ ingested documents
- Configured a live data ingestion pipeline to SAP work order data, enabling real-time access to facility issues
- Established 20+ structured data archetypes for SAP work order and spare parts data, enhancing search precision
- Conducted weekly engagements with technicians and engineers to continuously refine the application
- Led onsite User Acceptance Testing (UAT), where 100% of survey respondents found the application easy to use

Proven Results in Initial Production Deployment

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