CYIENT

YOUR ASSETS ARE TALKING; ARE YOU LISTENING?

An innovative predictive asset maintenance platform that can transform your organization

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Introduction

The data analytics revolution has descended upon us with the potential to transform the way companies organize, operate, develop talent, create value, and service their customers. The groundswell has happened, and momentum is building in many companies, but only a few are reaping major rewards from their data.

Companies are doing a great job of connecting assets, equipment, devices, etc., and gathering all that information en masse into distributed databases. Unfortunately, it is all too often a one-sided conversation of recording what is being said by the equipment. The challenge is finding ways to listen to what the equipment is telling us and responding in useful, actionable, and intelligent ways that improve business operations and reduce costs.

Like the conversations we have in our daily lives, it is vital to listen to what is said and respond to what we hear. It is easy to see why people feel it is better to leave the interpretation of data insights to the experts given the complexity of methodologies, the increasing importance of machine learning and the sheer scale of data sets. However, the strength of analytics lies in the informed decisions that people make on a daily basis, which is derived from data and embedded into work processes.

Effective listening enables companies to move away from reactive maintenance activities and move towards predictive maintenance activities. This can be a daunting task that not only requires solid tools to enable it, but also tools that connect with and enable employees to listen with ease to what these devices are saying. True success will come from breaking down the walls of silence between employees and the assets they are managing. Unfortunately, many asset management solutions gather and report data with little thought on how to support the change from reactive maintenance to predictive maintenance.

This white paper covers the typical challenges of developing solutions that asset-intensive industries experience while implementing predictive maintenance programs. It also focuses on ways to overcome these challenges by driving profit and growth from new technologies and leveraging the opportunities offered by big data and new digital operating models.

Problem Statement

Today's competitive business environment requires companies to bring their products to market quickly and more cost-effectively than ever before. Industries face demands like reduced downtime, improved operational and production efficiency, reduced maintenance costs, and effective forecasting. This means companies need to start moving away from a responsive maintenance strategy, adopt an informed reactive maintenance strategy, and ultimately to a proactive maintenance strategy, which can be difficult without the right solution.

The digitization of equipment and the Internet of Things (IoT) is dramatically changing business models for equipment manufacturers to equipment owners. Businesses, today, must keep up with the rapid pace of technology change, business innovation, security concerns, and deliver on expectations.

DOES YOUR DATA HAVE A PURPOSE?

IF NOT, YOU'RE JUST SPINNING YOUR WHEELS!

Advanced analytics and machine learning are becoming a part of organizations today. Big data helps us store what is being said and advanced analytics helps us digest it into meaningful bites. However, once it has been digested, it still needs to be turned into something useful. The real goal is improved business performance through actionable intelligence—not pristine data sets, interesting patterns, or killer algorithms; this is what every company is after.

IT IS IMPORTANT FOR US TO NOT ONLY HEAR WHAT OUR DATA IS SAYING, BUT TO RESPOND TO WHAT WE ARE HEARING.

Advanced data analytics is a means to an end. It's a discriminating tool that identifies, and then implements, a value-driving answer. No matter where it starts, the insights provided by analytics should be at the core of the organization's approach to continuously define and improve performance as competitive dynamics evolve. The other aspect is enabling technologies that employees can use to make decisions efficiently. Otherwise, businesses are not making advanced analytics work for them.

The focus has to be on leveraging big data and analytics to provide employees, with tools to work efficiently rather than make them experts in statistics. Asset management is handled by skilled workers like technicians, repair, and maintenance workers; providing them with the right information, analytics, and tools would enable them to do their job more effectively.

Solution – How it all Works

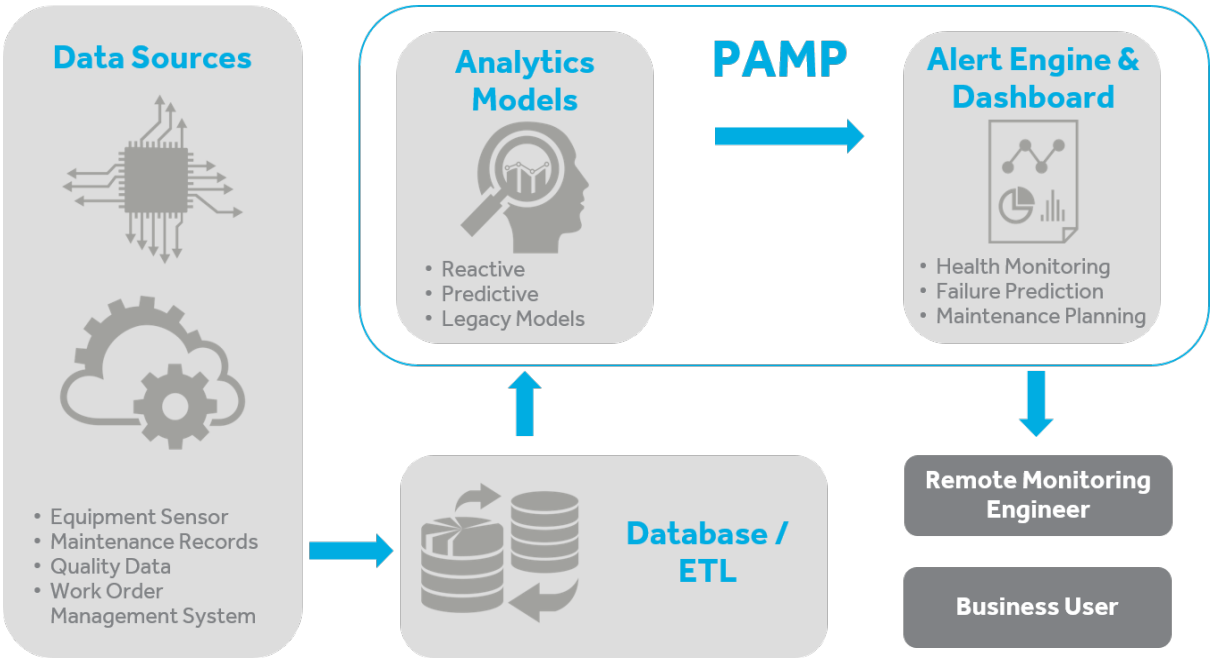
Many companies realize that the pace of business development is not in sync with the capacity of their underlying IT infrastructure. Additionally, many IoT connections are supported outside of the information technology (IT) infrastructure, such as operations technology (OT), and aligning the two disparate objectives of IT and OT can be challenging. Cyient's predictive asset maintenance platform (PAMP) integrates with the existing IT and OT technologies providing timely insights and intelligence.

PAMP, a cloud-based platform, is a highly scalable framework designed to manage and maintain simple to complex equipment intelligently. It helps companies build analytical algorithms that enable predictive maintenance programs with the connected assets it manufactures or maintains. This platform collects data from the connected equipment, analyzes it, and delivers insights on quality and operations in real-time. PAMP delivers actionable intelligence from the analysis via an elegant, intuitive web interface that can be accessed securely from anywhere on almost any device.

PAMP allows users to perform a deep dive analysis, scenario planning, and search for exceptional events and non-intuitive correlations. Finally, PAMP uses machine intelligence to identify patterns and move to a predictive analytics model over time, enabling preventative maintenance at the right time, which prevents problems before they occur.

The three-fold approach for designing and implementing the PAMP is as follows:

1. Leveraging the existing technology on the back-end

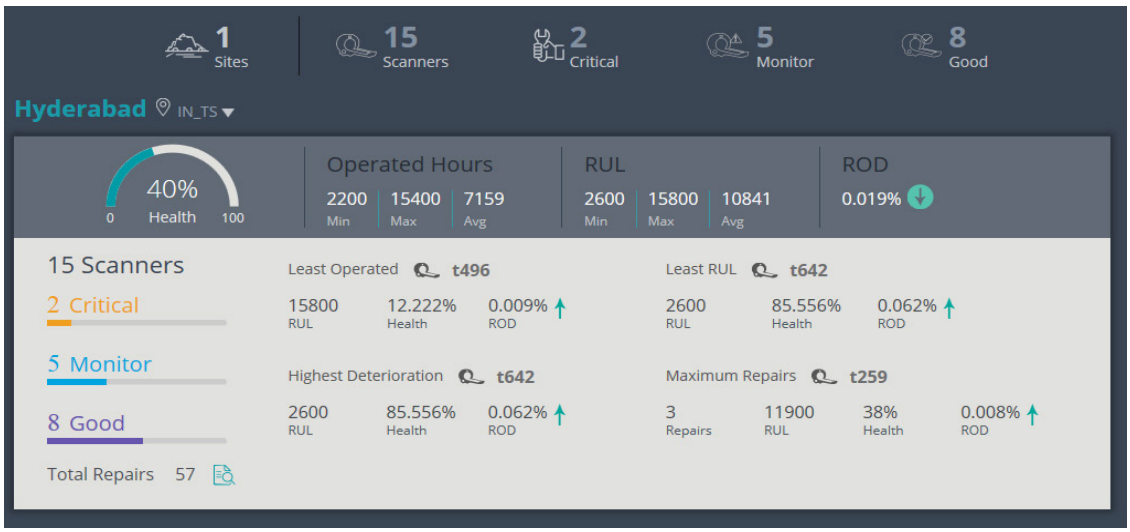


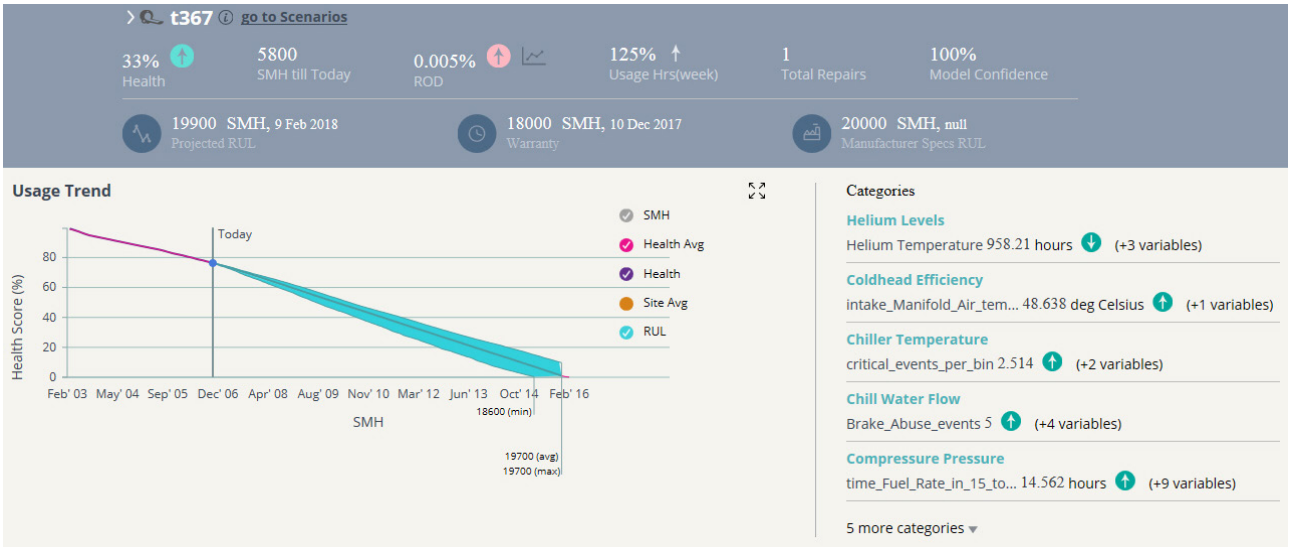
High-Level Representation of PAMP Technical Architecture

2. The platform's proprietary models and algorithms are applied to data in ways that provide meaningful insights
3. The flexible front-end can be placed on top as a standalone portal that can seamlessly integrate with the current tools providing an environment unique to each business

The core of the PAMP is designing predictive analytics for equipment and integrating planned maintenance activities in a visual dashboard that generates insights and suggests actions for equipment maintenance. Please find given below an example of the graphics:

The framework aims to support original equipment manufacturers (OEMs) by leveraging a powerful front-end experience with quality analytics models and approaches. These support new digital services, such as predictive maintenance or remote condition monitoring.





Example graphics of a dashboard showing data for a grouping of MRI scanners

The heart of PAMP is analytics—the ability to perform virtually limitless transformations, calculations, and functions on asset data.

Manufacturers of machines and industrial equipment can benefit from increased revenue and customer satisfaction while reducing claims and warranty costs with the use of PAMP. Their customers can reduce downtime, maintenance related costs, and energy consumption while increasing the lifetime of their machinery.

OEMs will have timely and continuous visibility into assets and equipment with the convergence of OT with IT, and machines being connected with production management, manufacturing execution, logistics, and enterprise planning systems. By applying advanced analytics to the data their systems generate, they can identify and predict performance bottlenecks and make informed decisions about how to improve asset operations, manage their workforce, optimize supply chain risks, and enhance the product design process.

Successful Implementation Result

Internal project research has shown a North American medical technology OEM, which correctly implemented a predictive asset maintenance platform, benefited in an average savings of **11%** in scheduled repair costs, reduced overall maintenance costs by up to **30%**, with up to **70%** fewer breakdowns. This directly affects production capabilities and throughput expectations.

Benefits from the PAMP

Companies can successfully leverage the power of data combined with analytics when there is a tool in place to access and find the appropriate information easily. Not only should the focus be on designing metrics that are powerfully predictive and informative, but also transformative for the organization. PAMP is intended to enable a continuous improvement process from an analytics perspective, and the insight generated. Additional benefits include:

Maximizes quality: An enterprise view of quality performance data, early identification of potential issues and root causes helps maximize production yield, manage the cost of quality, and increase customer satisfaction.

Reduces unplanned downtime: Predictive models monitor the system in near-real time to identify patterns that indicate a performance issue or likely failure before it occurs. Data visualization integrated with advanced analytics provides detailed information regarding the nature and severity of the problem, allowing companies to address issues before they cause downtime or performance decline.

Optimizes planned maintenance cycles: Automatic alerts enable businesses to plan and prioritize asset issues during regularly scheduled maintenance windows. By using maintenance resources more efficiently, companies can lower operational costs, maintain production, and increase equipment availability.

Effectively identifies and resolves root causes: Helps determine the real drivers of performance issues out of multiple measures and conditions and enables corrective and preventive action (CAPA). Case management workflows support speedy and repeatable problem resolution, highlight the best corrective action, and improve reliability, equipment efficiency, and quality.

Provides prompt answers: The tools run independently from the existing data and enable you to the desired insights faster.

Lowers the cost of ownership: The platform supports repair-or-replace decision analysis—downtimes, production losses, part costs, labor costs, event probabilities, etc., are all considered to find the most profitable solution.

Conclusion

The digitization of business is here to stay, and the pressure on industrial companies to deliver intelligent equipment to their customers is on the increase. While others talk about capturing or storing data, the PAMP solution captures and analyzes asset data and provides real-time insights via a series of easy-to-use web applications focused on monitoring and improving asset performance that leads to operational efficiency. Companies who listen to their equipment, focus on analytics along with improved business processes, can expect a faster return on their investment than those who focus on analytics without an effective platform to deliver insights.

Companies can now differentiate themselves by implementing the PAMP, which enables:

Highly scalable data management: Combines sensor data with other critical information for monitoring, model development, root-cause analysis, and reporting.

Predictive modeling: Accurately predicts failures of assets and equipment before it occurs.

Integrated advanced analytics: Obtains powerful, integrated, causal analysis of asset failures, and performance issues.

Model management: Automatically tracks the accuracy of predictive models over time, by tracking and documenting all actions, from model development to model retirement.

Enterprise business intelligence: Accesses the latest maintenance and operations performance indicators through a web-based, point-and-click interface.

Creates a data-driven culture: Organizations are finding that embedding data-driven decision making into the culture is critical to success. Tools such as PAMP foster and align with developing a data-driven culture focused on actionable insights.

PAMP was designed with a single purpose—to empower equipment manufacturers and owners in mission-critical industries with intelligent analysis of the data from connected devices. PAMP analyzes the existing equipment data for trends and relevant statistics, presenting that information to manufacturers in real-time in an easily digestible format independent of the data streams that already exist.

To find out more information about how your organization can improve business performance through actionable intelligence, contact a Cyient analytics representative at connect@cyient.com to view a short PAMP demo.

About Cyient

Cyient is a global provider of engineering, manufacturing, data analytics, networks and operations solutions. We collaborate with our clients to achieve more and shape a better tomorrow.

With decades of experience, Cyient is well-positioned to solve problems. Our solutions include product development and life cycle support, process and network engineering, and data transformation and analytics. We provide expertise in the aerospace, consumer, energy, medical, oil and gas, mining, heavy equipment, semiconductor, rail transportation, telecom and utilities industries.

Strong capabilities combined with a network of more than 13,700 associates across 38 global locations enable us to deliver measurable and substantial benefits to major organizations worldwide.

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