Ceaseless Creativity for a Sustainable World

MONITOR. PREDICT & PREVENT: PREDICTIVE MAINTENANCE THAT HARNESSES THE POWER OF THE I.O.T.

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This whitepaper will investigate the impact of operational downtime on printing businesses and how predictive maintenance that harnesses the power of The Internet of Things (IoT) can add value for modern process-oriented organisations.

Organisations work far more efficiently, profitably and with greater environmental responsibility when taking a proactive approach to machine maintenance, implementing systems that predict when a problem is likely to occur and initiating preventative measures to stop these from happening. SATO explains how and why this methodology should be adopted by forward-thinking businesses.

What is predictive maintenance?
Predictive maintenance is a progressive operational approach that minimizes downtime by anticipating rather than reacting to issues before they materialise into a problem and damage productivity.

Providing functional stability, predictive maintenance is rooted in the maxim that 'prevention is cheaper than the cure'. Detecting potential faults in advance, customers are alerted as soon as a cause for concern arises, enabling an appointment to be arranged for a technician to service the equipment. No nasty surprises, just good preparedness.

It is important to note that this whitepaper's definition of predictive maintenance refers to a more intelligent form of problem pre-empting than has previously been implemented by organisations using label printing solutions for track & trace systems. Consider for example a house with a fireplace and chimney. Every autumn the homeowner will arrange for the chimney to be swept in preparation for the colder months and increased usage ahead. This approach sounds logical in theory. However, it does not take into consideration the possibility that the previous winter may have been unusually warm and the fireplace was barely used at all, rendering an annual chimney sweep little more than an expensive habit.

Imposing possibly arbitrary services on machinery is therefore false economy and an inefficient use of time, money and resources. However, this outdated form of maintenance is widely implemented in today's label printing operations.

The alternative, and the approach employed by SATO, is to base maintenance plans and decisions on the real-time data derived from monitoring equipment. Most modern machinery, from printers to cars, is now equipped with sensors that monitor performance and detect potential problems, such as low oil levels or irregular temperatures. Forward-thinking, streamlined businesses are able to utilise this insight to optimise their service planning and

budgeting, following a course of action based on facts rather than what is essentially guesswork.

Why do organisations need predictive maintenance?
Without predictive maintenance, a printer failure can have a major impact on businesses resulting in that bane to organisational efficiency - downtime.

In today's fast-paced manufacturing environment, there is simply no space for operational downtime. Downtime costs businesses significant (and often under-budgeted) sums and working hours each year, impacting all processes - putting deadlines and client relationships at risk, damaging profit margins and having a negative impact on proactive CSR efforts. Employee satisfaction and the environment are also jeopardised when hours of inactivity are followed by the pressure and extra energy consumption of catch-up work, often incurring further expenses to recover lost productivity.

A November 2016 report by Bell and Howell for example found that more that 54% of businesses polled had experienced more than three downtime incidents in the past twelve months, with more than 60% reporting an average downtime incident duration of two to six hours. Over 17% said they could not tolerate even the slightest amount of downtime.[1]

A common scenario would see an hour taken to contact a help desk and identify the problem, followed by another couple of hours taken to assign the nearest technician. The site visit and maintenance would often be scheduled for a few working days in the future, with additional hours required to resolve the problem. Added together, this one fault could easily waste several days of operation.

These costs are compounded by the fact that many technician callouts are unnecessary, whereas translating virtual data into actionable, trouble-shooting measures empowers businesses to make more deliberate decisions about whether callouts are indeed needed.

By implementing maintenance plans that remotely monitor, predict and prevent issues, businesses can evolve beyond sporadic practices that are harmful to profit margins, project management, employee satisfaction and the environment. Using the information provided by machine sensors allows organisations to adopt a more streamlined approach befitting the interconnected nature of modern industry.

Predictive maintenance and the Internet of Things (IOT)
With the evolution of IoT, forward-thinking businesses are increasingly able to implement more stable, data-driven maintenance systems that help prevent problems.

IoT refers to objects that are connected to the Internet and communicate with each other to make users' lives easier. When devices and machines can talk to automated systems, they share valuable information that is analysed and translated into actionable problem-solving directions.

This technology is used in everyday life, for example in intelligent home systems that create connected homes by allowing users to remotely control heat, lights and sensors via a smartphone app. As well as offering convenience, this device communication promotes environmental efficiency and saves on energy bills with the ability to understand lifestyles; sensors in the home tell the system that the house is empty, triggering an automatic action to turn the heating or lights off. Smartphone geolocation then tells the system to put the

[1] Assessing the True Cost of Operational Downtime, Bell and Howell.

heating back on when you're returning home. These systems can also alert users to issues or faults, helping to prevent boiler breakdowns.

Manufacturers, logistics providers and more can harness this union between predictive maintenance and IoT to create truly intelligent, optimised and secure operations. Machine sensors are nothing new, and often only provide diagnostics with insufficient time to prevent downtime. By keeping pace with evolving technologies however, organisations can connect real-time sensor data to automated, web-connected systems that read this information and explain exactly what action is required to avert or remedy a problem.

Machine data can also be stored and automatically interpreted to identify trends based on real-world evidence, such as when a particular fault is likely to occur, which can then be extrapolated to put future plans in place. IoT-focussed predictive maintenance systems furthermore protect this data by hosting it in the cloud, backing up information to ensure that it's never lost.

Networked devices connected securely via the cloud also allow businesses to conserve resources when operating across multiple sites globally with as little as one technician monitoring an entire fleet rather than on-site staff monitoring at each location.

How predictive maintenance impacts field services

Predictive maintenance offers significant benefits for field services, helping to minimize the erratic nature and environmental impact of unscheduled emergency callouts.

It has been established that, without a smart maintenance programme that helps to prevent issues, a single machine fault could cause chaos for a business with unscheduled downtime and its related headaches. Operations are halted while the costly and lengthy process of arranging and receiving a technician callout has been completed.

Modern predictive maintenance minimizes this risk by removing the need for a technician or allowing a callout to be scheduled for a convenient time in the future. The data provided by interconnected machinery frequently enables site staff to follow simple steps to resolve issues on the spot without the need for external intervention, or to deduce that a service will be necessary within a specific timeframe. SATO for example has found that only 14% of all conventional servicing carried out by its customer engineers on-site requires the technical input of an expert, meaning businesses are unnecessarily expending time and money when scheduling unplanned emergency visits.

This however is only one side of the story, with field services also working inefficiently when their clients do not utilise interconnected machinery and sensor data in their maintenance programs. When callouts cannot be predicted or planned, technicians' schedules become erratic and clients must often wait longer for services, which may need to be repeated if a fault is difficult to diagnose or a part needs ordering.

On top of this, much field technician time is expended on seasonal callouts reminiscent of the earlier chimney sweep scenario where organisations take the outdated approach of arranging periodic equipment checks to spot potential future issues, rather than making use of hard data. Time and resources are wasted on both sides and experts are made unavailable to attend emergency callouts as a result.

Superfluous visits furthermore increase field services and organisations' carbon footprints by wasting fuel travelling to visit machinery that does not necessarily need addressing. This is exacerbated when parts are speculatively replaced on the assumption that they are likely to fail after a nominated period of time, rather than because real-time sensor data has detected

an actual problem. Such prodigal maintenance plans misuse resources and exhaustible materials and are harmful to the environment.

When machinery sensors are properly utilized through a contemporary predictive maintenance programme however, field service work becomes more organised and the opportunity for improved customer service emerges. Alerts, for example, can caution that a nominated service will be required within a predicted period of time, allowing clients to set up a convenient time for a visit. The same data advises the technicians on the nature of the problem, how to fix it and what equipment will be needed - enabling issues to be resolved more expediently, reducing downtime and preventing the need for repeated visits.

Customers can enjoy the confidence that the work being carried out by experts and the costs incurred are indeed essential, rather than simply a product of arbitrary seasonal planning or an action that could have been carried out in-house.

Preventative maintenance in action - SATO SOS and SATO Alerte

Examples of truly IoT-enabled predictive maintenance systems in action include SOS (SATO Online Services) and SATO Alerte, keeping people and technology connected to secure operational stability.

SOS is SATO's ground-breaking remote preventative maintenance solution, designed to keep operations on track. Minimizing disruption caused by technology glitches, this cloud-based system acts as a virtual on-site engineer, constantly monitoring and anticipating in order to translate data into pre-emptive trouble-shooting measures.

Compatible with the SATO CL4/6NX series of printers, SOS monitors printer status across multiple units and locations and shares this data with line managers or a central helpdesk, facilitating remote preventative maintenance and error detection.

By collecting a broad range of data such as wear status and serial number of parts, error logs, location and systems information, SOS enables efficient troubleshooting and equips printer maintenance technicians to offer recommendations for efficiency improvements.

SOS allows customers to choose the solution most suited to their organization's logistics and unique requirements, operating in two modes for added peace of mind. The 'real time,' online mode monitors printer status, offering the most up-to-date information with the security confidence of encrypted MQTT & HTTPS data communication. 'On-demand' mode conversely works offline, perfect for organisations where particularly stringent security protocols or lack of internet connection prohibit online connectivity.

Similar to SOS, Alerte is an advanced asset management system designed to satisfy the strictest organisational security requirements. Sending preventative maintenance notifications such as error logs, cleaning reminders and inspection prompts via the customer's email network rather than through a virtual cloud, the solution ensures no maintenance step is missed.

Offering outstanding security, Alerte can confine printer access to outgoing emails and can also be equipped with a firewall setting. It is whitelabelled to the customer's IT management as a safe, regular network user to ensure reliable email receipt. Emails can be sent to internal or external staff, with the added option of sharing alerts only with those to whom they specifically relate – optimizing efficiency and maintaining streamlined operations.

SATO SOS and SATO Alerte are more secure than many competitors' systems, giving users the highest confidence and assurance that their enterprise data is well-protected.

Conclusion
For businesses with heavy label printing needs to survive in today's competitive, fast-paced market, every area of operation must be optimised - especially with regard to minimizing downtime and environmental impact while maximizing labor and resource savings. A modern, IoT-enabled predictive maintenance programme is indispensable to achieving this efficiency, using accurate, real-time sensor data to reduce the need for or to better utilise field service technician support. The solution for spotting problems before they occur and streamlining your business with smarter servicing is here and it's ready to take the guesswork out of your printer maintenance requirements.

-ENDS-

About SATO

SATO (TOKYO:6287) bridges the last inch of the last mile for customers by integrating Auto-ID technologies and revolutionary materials to tag and track items, ensuring inventory visibility for improved user experience and business results. Engineering solutions that unleash the power of IoT, it provides value to customers in the form of accuracy, sustainability, labor and resource savings, reassurance and emotional connections. For the fiscal year ended March 31, 2017, it reported revenues of JPY 106,302 million (Euro 900 million*). More information about SATO can be found at www.satoeurope.com or follow us on Twitter or Linked In

*Conversion is based on an average exchange rate of 1 Euro = 118.74 Japanese Yen

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