Mobility Matters: Better Field Service Outcomes through IoT and Predictive Analytics

What's the real cost of equipment downtime? *Not only is it expensive for field service organizations (FSOs) to send a technician for diagnosis and repair (hopefully once), unplanned downtime means a productivity drop for business organizations – lost revenue and expenses that can accumulate quickly. So it's no surprise that a recent study by Field Technologies found the top two strategic initiatives for FSOs are improving customer satisfaction and increasing efficiency. To do so, field services organizations are increasingly applying predictive analytics to create improved, data-driven maintenance programs for their customers that deliver a winning combination by identifying when failures may occur, enabling delivery of just-in-time repairs and reducing field service expenses. Predictive maintenance programs offer FSOs a competitive edge, enhance customer satisfaction, and can power new revenue streams as well as streamline service delivery and increase the number of single-trip resolutions.*

This brief discusses how the combination of predictive analytics based on data gathered by IoT sensors and the use of mobile devices combine to reduce unnecessary scheduled maintenance while improving the overall service experience for both FSOs and the organizations they serve.

The Uptime Imperative

Equipment downtime costs can escalate at an alarming rate. While a Gartner study pegged the average cost of IT downtime at $5,600 per minute for IT outages, and as much as $540,000 per hour, recent outages were even more dramatic. For instance, a March 2019 Facebook outage of 14 hours cost the company $90 million in lost revenue, and a 2016 power outage of just five hours in a Delta Airlines operations center led to 2,000 cancelled flights and an estimated loss of $150 million. Just a single minute of downtime in an auto factory can cost over $20,000, and Simutech Multimedia reports that the average factory loses 5 percent and as much as 20 percent on productivity every year due to machine downtime.

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Maintenance Strategies Evolve

For decades, FSOs have relied on scheduled or preventive maintenance as the way to combat entropy and the failures associated with aging equipment. Motors and fans are routinely replaced, and even storage devices are retired on a regular basis, regardless of whether they show any sign of decay or performance loss.

While this approach often prevents failures from impacting the enterprise, it provides no insight into why devices fail, and thus cannot help predict future failures. FSOs must instead rely on industry standard benchmarks for mean time between failures (MTBF) to drive maintenance schedules. This often leads to unnecessary replacements, adding expense and resulting in avoidable downtime.

A popular alternative to scheduled maintenance is condition-based maintenance, where actual asset condition is monitored, and services delivered when anomalies are detected. Although this can reduce the overall costs vs. scheduling all maintenance, condition-based maintenance cannot predict all failures – thus there is still the risk of downtime due to equipment failure.

What is it that FSOs want from a maintenance strategy? Nearly every organization has common goals, including:

- Streamlining service calls to reduce time-to-repair and total on-site technician time
- Increasing first-time resolution to improve overall efficiency of the field organizations
- Achieve just-in-time maintenance to maximize the life of every asset
- Improve overall customer satisfaction to help drive service renewals

How can businesses achieve these goals? Through the use of predictive maintenance.

Preventative to Predictive: Data Driven Maintenance

Just as the name implies, a predictive maintenance approach can provide answers to game-changing questions, including:

- Will this piece of equipment fail in the near future?
- What is the remaining life of this asset?
- Are there any anomalies in the operation of this equipment that must be dealt with now?
- How can the settings of this piece of equipment be optimized or tuned to give longer life to the asset?

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At the core is predictive analytics. How does it work? By combining techniques including data mining, predictive modeling, and machine learning, a predictive maintenance tool can analyze current and historical facts to make predictions about future or otherwise unknown events. Two key technologies – IoT and mobility – go hand in hand to power today's predictive maintenance offerings.

Now, equipped with mobile devices, field workers can access equipment and machine data, work orders, customer information, and parts inventory on-site, becoming the human part of a mobile predictive maintenance solution.

As usual, predictive analytics is only as good as the data that powers it. Here, data generated by IoT sensors combines what's happening in a particular piece of equipment with aggregated data from similar devices around the globe. Other enabling technologies include big data warehousing, machine learning, deep learning, artificial intelligence, and edge computing.

By combining this with metadata from equipment (make, model) usage history and past maintenance data, a machine learning model then analyzes the data to report on the condition of the equipment and predicts the optimal time to service it - just in time. This helps avoid failure while extending equipment uptime as long as possible.

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The Many Benefits of Predictive Maintenance

A recent PWC report found that predictive maintenance in factories delivers some concrete benefits to FSOs, including:

- Lowering overall costs by 12 percent
- Reducing risk, specifically safety, health, environment and quality risks by 14 percent
- Improving overall equipment uptime by 9 percent by optimizing scheduling of maintenance
- Extending overall asset life by 20 percent – in effect "buy five, get one free" for each class of equipment

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Predictive maintenance also increases productivity and operational effectiveness by streamlining services, leading to further cost reductions for FSOs and their customers while improving safety. More importantly, enterprises can gain a better understanding of the root cause of failures and uncover patterns that may indicate a manufacturing or operational issue that would otherwise go undetected. End-user organizations can quickly derive the overall value of their assets – regardless of the age or condition of any particular piece of equipment.

What can this mean in real-world savings?

- Agricultural business Senter Farms was able to keep 10 of their 13 tractors running with a simple $300 fix instead of a pricey $6,000 drive replacement thanks to predictive maintenance, thus saving tens of thousands of dollars and ensuring that crop production was unimpaired during the critical growing and harvest season.
- Consumer appliance giant BUNN realized a savings of $300/unit on its manufacturing line thanks to IoT sensors coupled with predictive maintenance.

Why Mobility Matters

Mobile devices are the field technician's lifeline to perform diagnostics, and to capture and share data with peers and clients. Having a mobile device with access to the right information can reduce repeat trips thanks to availability of real time information. Mobile devices can also deliver real-time visibility into equipment and field agent status – any time, from anywhere.

Mobility is increasingly important across the board. In a recent Field Technologies study, all of the top five investment priorities for FSOs encompassed mobility in some way. They include:

- New mobile hardware investments
- New or upgraded field service software
- Mobile applications to improve FSO agent productivity throughout the day
- Mobile security to ensure compliance with regulatory and governance demands
- Fleet management and telematics to automate collection and dissemination of information about vehicles and agents across the board

A recent IDG study found that mobile devices also enhance other IoT benefits and enable proactivity. Nearly two in three respondents said that mobile device data enables a more predictive approach to maintenance and repair of all equipment.

However, to be most effective, mobile devices must be purpose-built for the FSO. That means devices should be ruggedized to prevent damage that leads to failure

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and deliver a low failure rate compared to consumer-grade devices. Mobile devices should also offer a long battery life with batteries that are easy to swap for extended use or for shift changes. The devices should also offer support for full range of Windows® and Android™ applications, with hardware and software easily manageable by the IT organization.

Making Predictive Maintenance Real

To that end, Panasonic purpose-built mobile FSO solutions help embrace the best of predictive maintenance. With powerful processors that can take advantage of state-of-the-art software enhancements, Panasonic TOUGHBOOK® devices simplify access to advanced applications that use machine learning, artificial intelligence, and the information in IoT sensors. These devices can enhance maintenance training, improve field inspections, and speed acceptance reviews and repairs to further drive field agent efficiency up while keeping costs down.

Panasonic offers rugged Windows laptops and Windows or Android tablets and handhelds, all ruggedized to military specifications to meet even the most demanding environmental conditions including, rain, heat, sand, and snow – and to be visible in any lighting from dim factory floors to blazing desert sun. Every organization's needs are unique, so FSOs can choose from 2 in 1, laptop, tablet or handheld form factors for each user, and every device is configurable with the ports, communications, and batteries to suit every need.

Panasonic TOUGHBOOKs are more than hardware – they combine with a broad array of software and services that help deploy and optimize field service needs, even providing life cycle support fleet-wide.

Panasonic ProServices include device imaging and setup, deployment, vehicle mounting kits and installation services, device management and a broad range of accessories, warranties and services for every FSO's business model. Panasonic hardware, combined with software, services and support provide a mobile predictive maintenance solution to help serve your customers more efficiently.

Next Steps

For more information about how Panasonic can help field services organizations, explore our TOUGHBOOK for Field Services page or visit the Knowledge Center.

TOUGHBOOK.com
TOUGHBOOK@us.panasonic.com
1.888.245.6344