Transforming the equipment industry with telematics and other disruptive technologies

Each organization along the equipment industry's supply chain—from equipment manufacturers, to dealers, distributors, rental providers, and aftermarket service contractors—stands to gain financially by being part of the burgeoning technology evolution. With the continuing buzz and optimism surrounding Internet of Things (IoT), equipment telematics, and always-connected devices, it would be easy to assume these new technologies will instantly solve all your operational issues and miraculously increase profit margins.

This can indeed be true, but only if the technology is applied prudently and in appropriate business areas. History has proven that blind adoption of new technology can actually cause added complexity, and ultimately, be counterproductive.

This paper examines how equipment manufacturers, dealers, and rental operators can transform their businesses and stand out from the competition by wisely adopting telematics and other disruptive technologies. By using technology in the right areas and applying it to core business operations, equipment companies can:

- Improve equipment uptime.
- Improve safety.
- Eliminate idling.
- Better understand actual costs and customer needs.
- Prevent theft.

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Aligning technology with business strategy

"If policy makers and businesses get it right, linking the physical and digital worlds could generate up to $11.1 trillion a year in economic value by 2025".

As a first step toward adopting new technology, equipment companies need to take the time to carefully consider their business goals, focus on market opportunities, and research the various disruptive technologies now available—while considering the short-term and long-term benefits of each. By taking this deeper dive and aligning the technology with their business strategy, companies can optimize their investment and feel confident they are taking full advantage of their opportunities.

This evaluation process should address the highly competitive nature of today's market. Customers have high expectations, seeking additional capabilities from the equipment itself—as well as from dealers and rental companies—that will make their businesses run better. Often, successful equipment companies play the role of the "go-to guy" or trusted advisor, providing expertise as well as value-added services ranging from top-notch preventive maintenance to business management tools, such as performance statistics and predictive trends.

Improving equipment uptime and timely preventive service are two areas of concern where technology can help. Whether you use telematics, machine-to-machine (M2M) communication, or IoT as a means of capturing data, your critical equipment components can send escalation alerts through intranet or Internet connectivity if there is an unexpected result or a performance anomaly, such as an energy usage spike or temperature change. Smart sensors mounted on the machines can monitor and communicate a wide range of data in real time, from velocity and capacity to temperature and exact GPS location.

This data can be used to improve uptime. Operating metrics of the equipment allow the dealer or rental provider to proactively take service action before the machine is in a "hard-down" situation. Customers can benefit from knowing that the equipment is reliable and can be trusted in mission-critical situations. And the dealer or rental provider has the opportunity to develop a valuable relationship with the customer—one built on long-term loyalty.

This can also help boost repeat and return business. If a dealer or rental provider is able to reduce downtime by 5% over the year, the increase in the value of the machine can actually be more than 5%. Similarly, with today's tightly scheduled jobs, a non-operational machine can create a ripple effect on an entire project. Non-operational equipment increases idle labor, causes the rescheduling of inbound materials, and results in missed deadlines with the chances of financial penalties.

Of course, taking advantage of technology in this instance is not as simple as just connecting a monitoring device to the equipment and measuring outputs and data points such as oil pressure, temperatures, engine values, or hydraulic parameters. Just knowing the data points and setting an alert for a particular value isn't going to provide a true profile of the equipment. Without a careful strategy, excessive false alarms or misdiagnosis will cause service technicians to mistrust the system. They will revert to the old "tribal knowledge" for repairs and preventive maintenance. While the old-school tactics still have merit, a prudent use of smart sensors can speed up the process and increase productivity—saving time and money.

The ultimate technology solution uses an advanced version of this tribal knowledge. The technology uses a profile of the normal operational characteristics and best practices for achieving ultimate efficiency, so it can know the hundreds of possible variables, predict outcomes, and prescribe actions for improvement.

Technology and software tools can take the thousands of individual data points and create profiles for each unit, and then compare the data to an entire population of similar equipment operating in different conditions.

This technology-enabled tribal knowledge approach is based on the statistical analysis of a large equipment population. For example, a worldwide maker of electrical transformers and distribution equipment recently began creating statistical profiles of its products in order to reduce unplanned downtime due to failures. The company uses this application of Big Data as a competitive solution when competing for bids in its market. Many industry experts view this Big Data statistical profiling as an essential step in improving the equipment and rental industry.

Technology transforms field operational processes

Beyond assisting with initial up-front sales and rental phases, new uses of disruptive technologies are also transforming equipment operations in the field.

Improving safety

Safety is a paramount focus in the equipment industry, with the burden of accident avoidance often falling on the dealer or rental provider.

Telematics can play a major role in reducing dangers to operators and workers in the workplace. Focusing on engineering improvements to improve safety is proving to be effective. Engineering improvements, cannot completely prevent user mistakes, but telematics can help minimize potential dangers and damage from operator error.

Telematics can be used to monitor and report on certain user traits and equipment performance characteristics, such as warning signs that an unsafe condition or high-risk activity may be taking place. These warning signs can be communicated to the operator, manager, or owner, so they can escalate the warning to further investigation or initiate safeguards.

For example, Figure 1 details a crane's usage of sensors that can monitor conditions such as tipping, overload, and hundreds of other operating characteristics.

Figure 1: This crane has multiple sensors that can monitor a variety of conditions.

While this type of information can be presented directly to an operator, the data can also be included in a knowledgebase that monitors for prescribed conditions and automatically alerts the operator, manager, and owner if at-risk conditions occur. Tracking safety allows an equipment company to protect its assets and workers, and helps protect the equipment company's liability. The company can also use data to determine if further steps need to be taken, such as training on proper operation. In the event of an accident, documentation can also be valuable in determining liability.

An extreme, real-world example

This incident began with a call from the machine operator to the contractor at 4:30PM on a Friday. "Boss, I got the excavator stuck," the operator said. The excavator was supposed to be finished with the job and returned back to the equipment rental firm by 4:30PM—which, obviously, now wasn't going to happen. Assuming that the equipment rental company was optimally managing its assets, after the excavator was returned, it would be prepped and re-rented the next day (Saturday) or weekday (Monday). This unexpected incident derailed that plan. It would take some time to extricate the stuck excavator because it had sunk in mud all the way up to the cab (Figure 2).

Figure 2: If this excavator had sent warning alerts back to the equipment rental firm, perhaps the rental manager could have intervened before too much damage was done.

To make matters worse, the excavator would require maintenance before it could go back out in the field because the engine breather had ingested mud.

After spending most of Friday night freeing the sunken excavator, it wasn't until the next day that it was finally returned to the rental company. The machine was subsequently down for maintenance and repairs for most of the rest of the week.

How could the use of telematics have prevented such an incident? By capturing and transmitting field data, including GPS location, back to the rental company. This would have allowed the manager to see that operations were not within normal standards. Early warning alerts in the machine's cab could have possibly prevented the operator from making the wrong decision—trying to free the machine when it was first in trouble. The information also could have made the rental firm aware that that the equipment might not be available to re-rent and they could have had service technicians on standby.

Identifying "expensive customers"

In addition to safety and accident prevention points, telematics can also be helpful in identifying "expensive customers." These are high-volume customers who abuse the equipment they rent or operate the rental machines at the "red line." Or, they may be customers who routinely don't return equipment at the scheduled time. While late fees can make up for the inconvenience, it still creates havoc with planning and scheduling, and forces companies to maintain just-in-case equipment inventory to meet other customer commitments. While this is primarily an issue for equipment rental providers, it can carry over to the equipment dealer market as well. For dealers, expensive customers can be those who consistently have a higher frequency of warranty failures and claims.

Understanding actual costs

Telematics and technology can provide a profile of a customer's operating characteristics and help the dealer or rental provider understand the actual costs of renting or selling equipment. The equipment companies can use this information to build marketing and sales opportunities, develop plans to address expensive customers, and find ways to make expensive customers less costly, while still retaining them. They can use this information to target specific customers and operators for educational opportunities on the proper use of the equipment, and also make recommendations for equipment that's better optimized for a customer's specific needs based on the customer's actual field use.

Better understanding customer needs

Telematics also can help a dealer or rental provider differentiate itself from the competition through the way it charges for equipment rentals. Traditionally, they charge by the hour, day, or month. Technology now makes it possible for them to charge based on the actual work accomplished. For instance, a dealer or rental provider can rent a crane out by the number of lifts or the total weight lifted. This could allow them to better match equipment to the actual customer, and should result in a more competitive bid, higher overall utilization, and better matching of the use of the machine to revenue.

Preventing theft

It's estimated that the annual cost of construction equipment theft is between $300 million and $1 billion. With increasing theft and vandalism of equipment on jobsites, knowing where assets are at any time is a valuable benefit that's critical to the bottom line. Telematics can help dealers and rental providers know exactly where their assets are located. Motion alarms can be used to monitor equipment; machines can be disabled after normal operating hours and weekends; alerts can be sent out if equipment leaves a designated operating area. Even service hatches can be monitored so that an unsanctioned opening will send an alert.

Not only can telematics help a dealer or rental provider keep a close eye on rented equipment, it can also help them prevent the theft or swap of attachments, and individual engine and hydraulic components. In some regions, this type of theft has been occurring on off-road vehicles with greater frequency. For instance, new engine parts are being swapped out of rented trucks and replaced with older, out-of-warranty components. This type of theft could be prevented by using telematics to monitor valuable equipment parts.

Teaming up with the right solution provider

Telematics and the use of IoT and M2M technology can create opportunities for dealers and rental companies of heavy equipment to see significant gains; but only when the technology is used to address specific and critical business needs. To take advantage of these capabilities, an equipment dealer or rental provider will need to partner with a solution provider who not only provides the physical sensor telemetry, but also has a complete end-to-end solution that can collect the data, create the operating profiles, and manage the delivery and execution of the service solutions—including human capital utilization and deployment, service parts management, and even proper education for service technicians.

Teaming up with a solution provider who can provide a complete solution, rather than just hardware, is the key to a successful strategy. To be successful, equipment dealers and rental providers need to tie technology and data in to their core business operations. When they create a sound strategy, they can derive great benefits from disruptive technologies—such as telematics.

Learn more about Infor's solutions for equipment dealers, rental, and service providers

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