

You Can't Improve  
**OIL & GAS PRODUCTIVITY**  
from Inside a Filing Cabinet



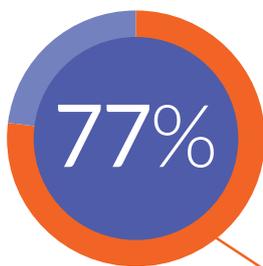
## EXECUTIVE SUMMARY

You've probably heard this famous catchphrase associated with USS Enterprise Chief Engineer Montgomery "Scotty" Scott from Star Trek: "I'm giving her all she's got, Captain!"

In the all-science no-fiction world of oil and gas production, wishful thinking and a white-knuckle grip won't squeeze any extra juice from the engines. You can't "give her all she's got" and magically maximize efficiency — no matter how motivated the crew might be. The harsh reality is that you need concrete measures to recover from and prevent unplanned downtime.

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Wouldn't it be nice if real-world enterprise could work like the starship Enterprise? Real world businesses know that improving efficiency isn't as easy as a quick call down to engineering.

We've looked into the struggles experienced by operators at every stage of production — from exploration to refining — and we believe sudden spurts of inefficiency are a relic of the past. In this whitepaper, we'll discuss the cost of unplanned downtime, address what causes it, and some of the ways the gas and oil industry is coping — and conquering it.

# THE HIGH COST OF UNPLANNED DOWNTIME

You wouldn't buy a car that you could only drive some of the time. Of course, you know that whether you forked over a fortune for a top of the line luxury sedan or pinched pennies for a used pickup, there are times when you expect periodic maintenance. Occasionally you need an oil change or an air filter replacement.

An oil or gas well and the many machines and operators it hosts require periodic maintenance and audits, too. To be "road ready," a well needs inspections, routine repairs, and reliable reports.

When the wheels of your drill site roll over an unseen nail in the road – like a sagging, cracked boiler breaking down – your ride ends.

The engine that drives your profits can't turn over until a technician repairs or replaces the malfunctioning parts. On the other hand, when a well and its crew are merely "giving her all she's got" without any credence to the underlying issues, they're inevitably operating below peak efficiency.



## Dollars And Sense

How much money you waste “doing nothing” depends largely on rig rates, equipment leases, and operator wages, all of which can vary widely by location and type of well. Some wells might lose as little as \$20,000 per hour of unplanned downtime, while others may hemorrhage funds into the millions.<sup>2</sup> However, there are some concrete facts about the cost of unplanned downtime in oil.

Aberdeen research revealed a rise in the cost of unplanned downtime across all businesses from \$164,000 per hour in 2014 to a hefty \$260,000 in 2016.<sup>3</sup> The average downtime event from all industries lasts about four hours-- and tips the scales with the stomach-churning cost of \$1,040,000 per episode.

When investigating just oil and gas producers, Kimberlite estimated that a mere 1% of unplanned downtime—roughly 88 hours— costs \$5.037 million annually. At just over 27 days average downtime per year, offshore oil and gas organizations encounter \$38 million in lost profits from unplanned downtime.

The inflating cost of downtime represents a departure from the safety net once provided by \$100 per barrel oil. As the global cost of downtime rises, the need to maximize uptime has never been more pressing.

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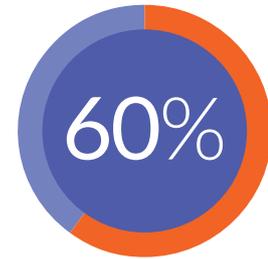
*in lost profits from unplanned downtime.<sup>4</sup>*



# THE CAUSE AND EFFECT OF UNPLANNED DOWNTIME

Unexpected downtime often comes with mountains of information and piles of paperwork. A 2016 Kimberlite study revealed that 60% of oil and natural gas operators identified dealing with data outcomes as a major challenge. When a catastrophic failure occurs, the sheer volume of data can be overwhelming. Often, the reason a well stagnates after a shutdown is due to a cumbersome backlog rather than mechanical hurdles.

As the Internet of Things (IoT) becomes an increasingly integral part of everyday life, it's apparent that the days of chronicling every report with spreadsheets and carbon paper are ending. GE estimated that a single gas turbine compressor blade can generate 500 gigabytes of data per day.<sup>8</sup> Even more daunting is the fact that every 30,000 miles of pipeline adds another 17 terabytes of information—more data than every book in the Library of Congress. That's a lot of evidence to gather for your inspectors, certainly more than you can scrawl with a pencil and clipboard during a typical workday.



*of oil and natural gas operators identified dealing with data outcomes as a major challenge.<sup>7</sup>*

Not only does the threat of downtime burden crews with recording and correcting issues in a vacuum, but it also robs companies of timely reports and the ability to issue instant feedback.

Better evidence means you can understand unplanned downtime before it's too late. On the other hand, lethargic data collection leaves gaps in your reporting and the ability to manage workflow. A 2016 study by Aberdeen revealed that companies embracing data mobility saw a 15% decrease in their time-to-decision.<sup>9</sup> Imagine having a gateway at your fingertips that can issue tasks and control the timing, location, and quality of your reports. It could effortlessly offer the authority and confidence to act before disaster strikes.

That's how a mobile data solution has shaken up some industry leaders' operations. In the next section, we'll discuss the ways that cutting-edge oil and gas providers have begun to futureproof their asset management, employee auditing, and response to emergencies using an inspection platform.

## Cutting Maintenance Costs With Asset Management

*Over half of global oil production comes from machinery past the halfway point in its lifecycle.*<sup>10</sup> As those machines experience wear and tear, parts are replaced. Warranties may be filled, and when the maintenance margin reaches a head, the equipment is scrapped for newer gear. In the course of juggling these maintenance operations, you need to be certain that inspections are valid and on time. You need to know who completed which inspection, when and where they performed it, and whether it has issues in need of remediation.

A good mobile data solution will track these variables with GPS, time, and date stamps. It will send corrective actions pouring out after a failed inspection the moment the report occurs. Most importantly, it will make it easy to understand and share reports and follow-ups with colleagues on a collective user portal. With these, you're not just slapping a bandage on maintenance issues; rather, you're vaccinating yourself against future failure.

Imagine a mud pump in the field. It's been hard at work for years, and during that time it has seen numerous repairs, tune-ups, and inspections. When a new crew onboard at the site, they rely on the data collected about this pump's maintenance. Is the piston rod a replacement part? Is it under warranty? When was the last inspection? This is where a database that can coordinate inspections and workflow really shines.

When engineers sort equipment by the date of last inspection, they can effectively extinguish the maintenance backlog. Tighter schedules brought about by digital asset management allow inspectors to provide proper preventive maintenance and avoid equipment failures. Ensuring the inspection was done on time and at the right location gives your company men and women the ability to prioritize which inspections are the most urgent. If they can manage workflow on the move with digital data platforms, they don't have to wait around to submit forms.

Ranking inspection urgency is just the beginning, though. Comparing the chance of failure and the consequence of failure remains a key factor in determining course correction. When a minor setback threatens crew comfort, it's not quite as imperative as one that halts production or jeopardizes health, safety, and the environment. Assigning tasks based on risk assessment effectively steers maintenance toward the most mission-critical assets and provides for both worker welfare and consistent upkeep.



***When you adopt a digital platform for data collection, the keys to understanding reliability and planning should be right at your fingertips. Smart data helps define the risks for a site, a network, a method, or a single asset.***

## Auditing: A Data-driven Safety Tether

Today's oil and gas operators can easily become mired in the oceanic trench of safety and environmental regulations. From ISO to OSHA, from China to the Gulf of Mexico, it's difficult to ensure that workers are compliant with local legal protocols and company directives. Employees, just like machines, require periodic checks to guarantee they are working according to script. When regulations change, it can feel like the tectonic plates of compliance are shifting beneath them. Slowly, sure, but unrelentingly so.

A comprehensive update to health and safety standards like ISO 45001, which spans more than two dozen countries, can really throw a wrench in the gears of compliance inspections.

Garnering an ISO 45001 certification requires inspectors to be familiar with new safety requirements, inspection forms, and auditing procedures. Large companies might shell out six figures for a second-party inspection just to free themselves from the hassle. Yet these mercenary inspection agencies offer their services for a hefty markup, far too high for any organization trying to weather the storm of an unstable oil market.

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Even if your organization is already compliant with previous ISO regulations, bridging the gap to ISO 45001 means:

-  Hiring auditors to manage change
-  Purchasing software to bring your practices up to spec
-  Training your crews to obey new regulations
-  Evaluating compliance

Both outsourcing your audits and paying for quick-fix software are temporary solutions to an ongoing issue, that the bare minimum in health and safety isn't enough. You need to be able to trust your on-site crews and inspectors to report hazardous equipment and behavior and correct it on the spot. You need them to go above and beyond what is required.

When a crew fails to report dangerous behavior and near-misses, it can result in disaster. If the managers in charge of a well aren't keeping their subordinates compliant, the company could be held financially liable; worse still, a crew member could lose their ability to work or even their life. However, two things are certain: oil and gas is a dangerous field, and compliance can mean the difference between life and death.

One way that industry mavens are trimming down their corrective action workflow is with cloud-driven inspection tools. The best digital safety management solutions are capable of running on-the-spot workflows that not only help workers understand when equipment or behavior is non-compliant, but they also tell the inspector how to correct that error right away.

Let's say a rig crew manager submits a "red flag" issue. Here's what should happen next:

-  They receive an automatically generated task built from contextual info
-  They access support documentation and reference material
-  Real-time alerts notify the responsible parties about the issue
-  Approval processes begin immediately and administrators oversee corrections

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Instead of weighing them down with a thousand-page safety manual, each issue can be addressed with the relevant corrections one at a time. When you can get accurate information about about who is doing what and how they're doing it, that can make the difference between uptime and downtime

Getting a grip on the data inspectors see and the steps they take in the field requires company leaders to foster good reporting and strong communication. It starts with a positive safety culture, but it continues with every byte of data that ends up in the company cloud.



## What if a crew member shows up without the proper footwear or head protection?

The behavior should be documented on the spot, of course. But often crew leaders don't have the information and feedback they need to make the right corrections. Will the supervisor report the hazardous situation in the field accurately, and will he know how to correct it according to company guidelines when and where it occurs?

We certainly hope he would! But if he had the option to document, dictate, and photograph evidence right away, he'd be much more likely to take care of it while it poses the greatest risk. If he got instant feedback that gave him the exact corrective actions to take, he could mitigate the risk right away. That makes his job easier - and the work site a lot safer.



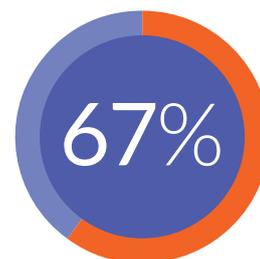
# DISRUPTING UNPLANNED DOWNTIME

In today's oil and gas marketplace, uptime matters more than ever for producers. During the forgiving years of \$100 oil, downtime wasn't the crippling concern it could be in 2014 or even today. Even as oil prices rise to a more comfortable \$75 and up, operators have adopted a sharper attitude from the downturn. Reliable revenue remains critical for a balanced budget and future sustainability, and that means a zero tolerance policy on downtime.

In a recent Kimberlite poll, more than 67% of oil and gas industry insiders indicated they expect a deep impact from digital interruptions. It's increasingly common for everyone from offshore to land-locked fracturing to adopt technological solutions to combat downtime. Among those technological disruptions are digital platforms for inspections, audits, and data visualization. Software like this is commonly known as SaaS (Software as a Service), and it's taking the industry by storm.

While SaaS includes a broad spectrum of products and services, data collection platforms manifest in the field as user-facing applications accessed through a handheld device. The most flexible platform available, Form.com, offers the advantages of coherent data collected in a cloud combined with the ease and familiarity of consumer electronics like smartphones or tablets.

As the industry continues to evolve, operators look to services that tackle emerging challenges like shifting regulations or a volatile market. Mastering change management, operational excellence, and field efficiency all hinges on the tools used in data collection.



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## Choosing A Mobile Data Solution

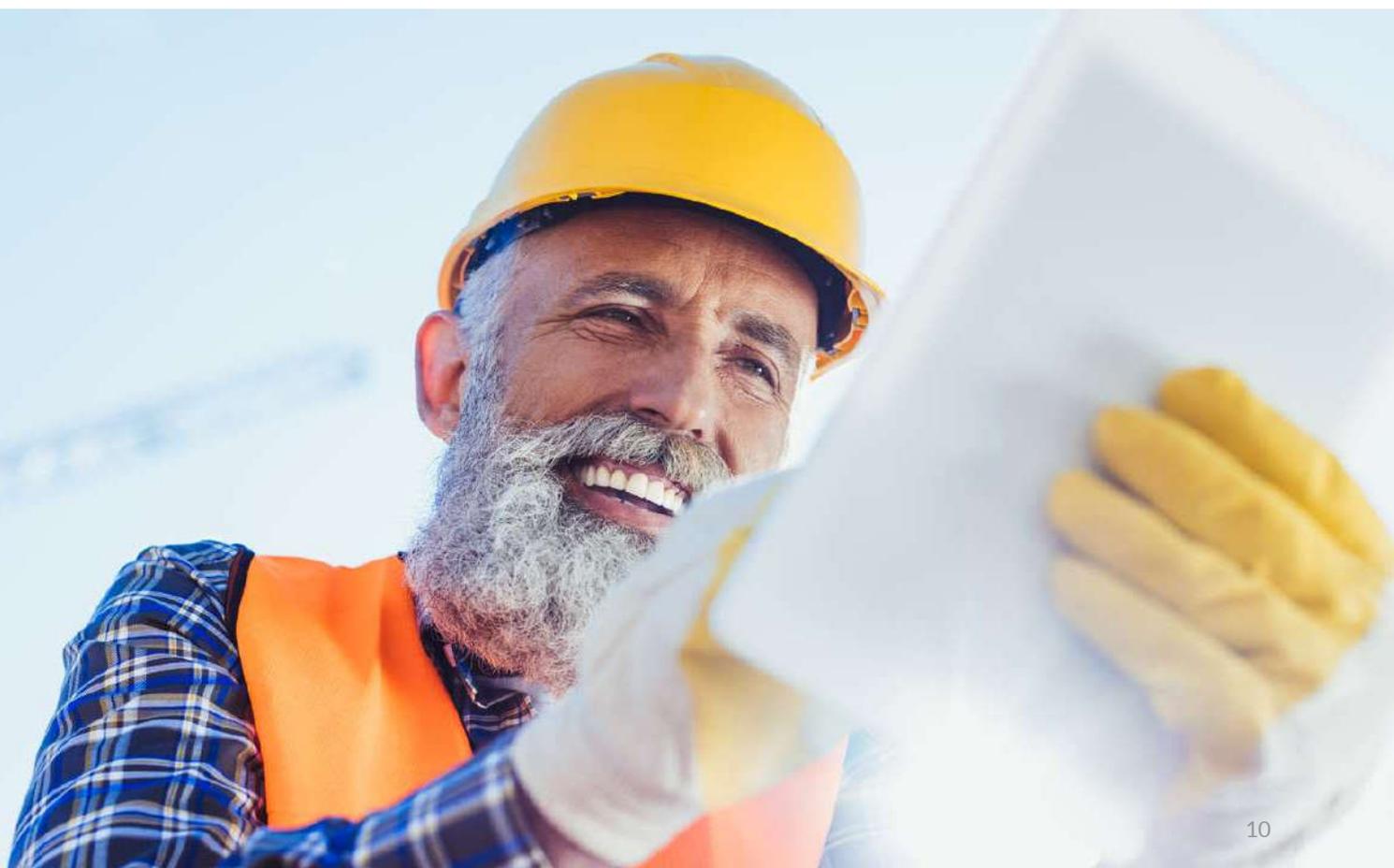
In the first chapter, we discussed how unplanned downtime carries a stomach-churning price tag. You might recall that the average annual cost of just 1% of unplanned downtime in the oil and gas industry rings in at over \$5 million. So, the first step to picking out a mobile SaaS solution is to consider exactly how much you're spending on lost production. If collecting better data could save you even one percent of your downtime, it's worth it.

In the second chapter, we discovered that lapses in data, especially gaps in inspections and audits, are at the root of unexpected downtime. The next step to determining if SaaS is right for you requires evaluating your current practices. Perhaps you've lost track of one too many warranties, or maybe reporting is restricted to a computer back at the home office. If inspections are slow and chaotic, if your organization is struggling with double entry and noncompliance, mobile data collection could ease the burden.

While some companies can afford sluggish reporting and ad-hoc maintenance, that doesn't mean they don't stand to profit with mobile data collection. When you consider the amount that could be saved, the real question is "Can you afford not to try mobile data collection?"

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# Choosing a Mobile Data Solution: BUILD vs. BUY

Approaching SaaS for the first time can be daunting. Should you build your own platform or buy an out-of-the-box solution? There are many variables when choosing mobile data solutions, and we've outlined a few of the most critical considerations below.

## BUILD IN-HOUSE

PROS

-  Tailored to business needs
-  Complete control of solution
-  Developers know nuances
-  Ownership of code
-  Full control and flexibility
-  Support from developers

CONS

-  Extended development timeline
-  Internal resource drain
-  Software quickly out of date
-  No economy of scale
-  No documentation or training, minimal support
-  Ongoing support & maintenance costs
-  Stability & security questions

## BUY OFF THE SHELF

PROS

-  Covers most of your requirements
-  Fast timeline and economy of scale
-  Guaranteed to work, fewer bugs
-  Automatic enhancements & upgrades
-  Lower total cost of ownership

CONS

-  Might not meet your unique needs
-  Rigid platform can't be customized
-  May not integrate with legacy systems
-  Competition/wait time for features
-  Third Parties lead to competing invoices
-  Point solution – no support, no insight into security

## Customize With Form.com

Form.com provides an integrated mobile solution that fits any process. With a tailored and flexible mobile data platform, you can customize and orchestrate just the features you need without slogging through months or years of development.

Features like workflow automation and task management take the guesswork out of maintenance schedules and provide cloud-synced accountability. Put your data to work in a Business Intelligence dashboard that visualizes problem areas and highlights issues by analyzing trends over time.

# CONCLUSION

You don't need a space engineer like Star Trek's Scotty to maximize efficiency. From the offshore well to the shallow jackup, mobile data collection is rapidly changing the way operators deal with the downturn. Oil and gas producers on the cutting edge have bolstered their businesses against unplanned downtime and unpredictable market trends. Don't wait until it's too late. "Giving her all she's got" only works in science fiction.

Bring your business up to warp speed with Form.com and schedule a custom demonstration today.



1. <https://www.mckinsey.com/industries/oil-and-gas/our-insights/why-oil-and-gas-companies-must-act-on-analytics>
2. <https://www.forbes.com/sites/netapp/2013/10/07/whats-it-downtime-cost/#40dce76b3269>
3. <http://www.aberdeenessentials.com/techpro-essentials/stat-of-the-week-the-rising-cost-of-downtime/>
4. [https://www.geoilandgas.com/sites/geog.dev.local/files/ge\\_offshore\\_study\\_paper.pdf](https://www.geoilandgas.com/sites/geog.dev.local/files/ge_offshore_study_paper.pdf)
5. <https://www.bhge.com/sites/default/files/2017-12/impact-of-digital-on-unplanned-downtime-study.pdf>
6. <http://www.ogfj.com/articles/print/volume-13/issue-5/features/innovate-to-get-through-this-cycle.html>
7. <http://aberdeen.com/research/13232/13232-KB-mobility.aspx/content.aspx>
8. <http://www.ogfj.com/articles/print/volume-14/issue-10/features/asset-management.html>
9. <https://www.bhge.com/sites/default/files/2017-12/impact-of-digital-on-unplanned-downtime-study.pdf>



## Got questions? We can help!

Form.com delivers flexible mobile/offline solutions to ensure safe behaviors, equipment, and sites for the enterprise. Our customizable applications let you access and complete forms from anywhere, even while offline, and our team of experts will work with you every step of the way to create your ideal solution.

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