The State of Intelligent Operations in Oil and Gas

Based on the results of our Intelligent Operations in Oil and Gas survey, this report reveals the extent to which oil and gas is adopting Intelligent Operations and its impact on efficiency throughout the industry

Inside:

> Why Intelligent Operations adoption rates continue to increase in oil and gas
> The content solutions being implemented in operational environments
> The impact of Covid-19 on day-to-day operations throughout oil and gas

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Introduction

Across many industries, businesses that have implemented digital transformation initiatives are finding themselves ahead of their competition, as many of these organizations turning to Intelligent Operations to reduce human error, increase productivity and support compliance efforts.

In oil and gas, Intelligent Operations have the ability to play a vital role in providing a connected content environment. This report, produced in collaboration with OpenText, dives into the results of our *Intelligent Operations in Oil and Gas Survey 2020,* which was completed by 75 oil and gas professionals and revealed where the industry is in terms of adoption of Intelligent Operations and the hurdles it needs to overcome to truly embrace digital platforms and solutions.

This report looks at the survey's major data points, exploring themes such as whether organizations are providing their operational staff with mobile access to critical operating data, the growing importance of forward-looking content strategies, and the technologies that organizations should look to employ in order to improve the efficiency of their operations and effectiveness of their content.

Featuring insight and analysis from industry experts, this report also considers the impact of the Covid-19 pandemic on operational transformation strategies and how it has changed the approach many organizations are taking toward their operations.

Contents

"Informed and connected workers get information to the right people at the right time, enabling companies to make safe and effective decisions."

Martin Richards
Senior director and energy industry strategist at OpenText

The adoption of Intelligent Operations within oil and gas

While more than half of the respondents to *Oil & Gas IQ*'s Intelligent Operations in Oil and Gas Survey 2020 revealed that that their core process were digital, a surprisingly high 29 per cent said that that they had yet to fully implement automated processes (see Figure 1). It is evident that the industry still has a long way to go in its adoption of Intelligent Operations, with just 33 per cent of those surveyed stating that only a few of their processes and documents were digital. Some 15 per cent – representing more than one in 10 companies within the industry – said they had yet to begin implementation of a digital strategy, leaving them far behind their competitors whose digital initiatives are already well underway.

Nick Revelas, future energy transformation strategy lead at OpenText, says the fact that 15 per cent of businesses have yet to begin implementing their digital strategy is unsurprising considering the slow pace of maturity in managing content in context to any transformation, be it digital or other.

Cloud computing in energy has been available for many years and those that hesitated to move are already behind," Revelas notes. "Cloud platforms for a wide range of solutions across the energy sector have become mainstream. While many data-driven solutions that incorporate advanced technologies such as data science, machine learning and AI hold promise, there remains a critical element of available and accurate content such as drawings and operating procedures that form the backbone of an operating company.

"Information management maturity and digital competency are still in early stages and are still maturing," he adds. Intelligent Operations, however, is not just about digital transformation; as Revelas explains, "it's also about the simple things people can do straight away".

"Many operating companies need to improve their governance and availability of critical content

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Figure 1

Where do you consider your organization to be in its journey to Intelligent Operations?

- Some processes and documents are digital, but there is more work to be done.

- The majority of our core processes are digital, but we have yet to fully implement automated processes.

- The majority of all our business areas operate digitally and key processes have been automated.

- We have yet to start implementing our digital strategy.

- Our systems and processes are digital, with advanced implementation of automation.
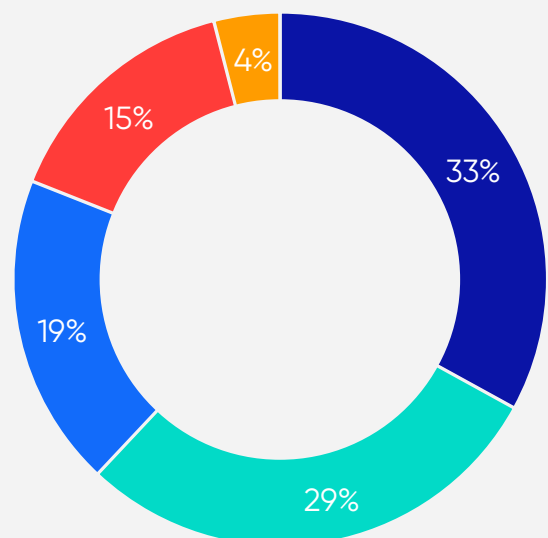
Source: *Intelligent Operations in Oil and Gas Survey 2020, Oil & Gas IQ*

Figure 2

Where does your organization currently store its critical operational content?*
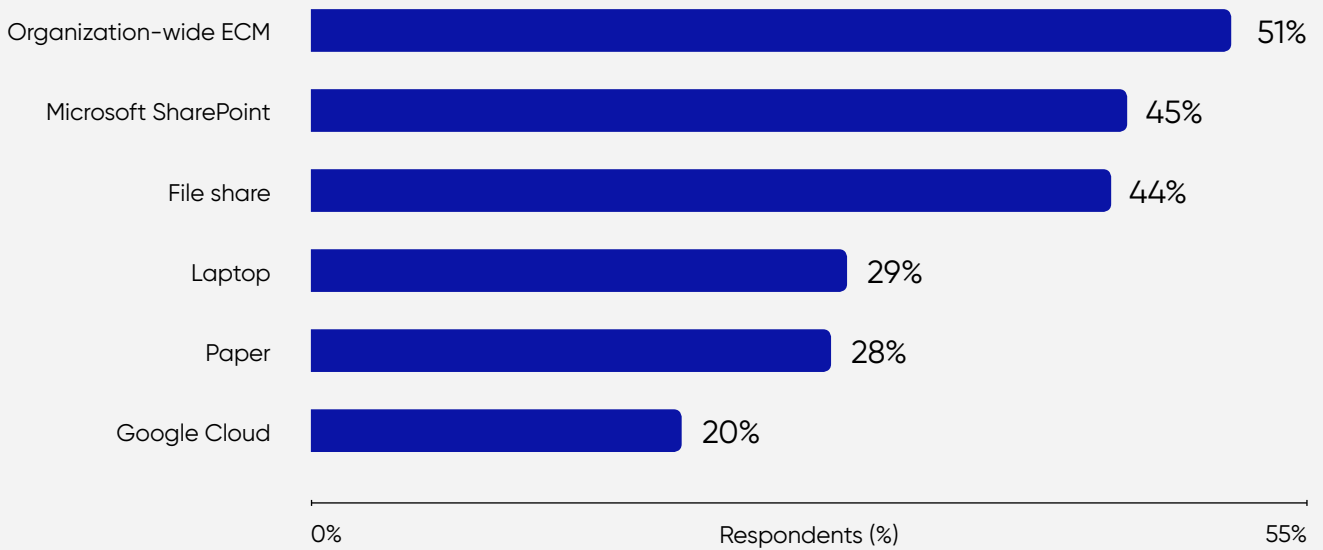
Organization-wide ECM	51%
Microsoft SharePoint	45%
File share	44%
Laptop	29%
Paper	28%
Google Cloud	20%

0%   Respondents (%)   55%

*Respondents could select multiple answers

Source: *Intelligent Operations in Oil and Gas Survey 2020, Oil & Gas IQ*

such as operating procedures or engineering content required for maintenance, process safety or management of change, he says. This is a simple example of what's being forgotten in the fever for all things digital and AI. It's really about making sure the information management foundation is solid, rather than trying to build an AI or IIoT house on shifting sands."

Among all of the statistics thrown up by our industry survey, however, one fact seems remarkable in a world forced into relying on remote working solutions and digital networks to continue functioning: that 28 per cent of oil and gas organizations continue to use paper to store some or all of their content (see Figure 2).

"The oil and gas industry has been traditionally slow to accept change," says Fred Stawitz, oil and gas veteran and president of oil and gas consultancy Storymakers, Inc. "Given the challenge of oil earning less than $50 per barrel and a turbulent economy, executives may be less than eager to invest in technologies when the back-end savings they produce seem distant and uncertain.

"Automating processes means someone has to give up an element of control in favor of business efficiency," he adds. "Hesitancy to relinquish control is seen in the reluctance to accept technological improvements."

The industry, while not embracing digital solutions at a breakneck speed, does appear to be moving in the right direction at least. The main motivations to embrace these solutions cited in our survey include increasing productivity (79 per cent), reducing costs (69 per cent), and optimizing production and maintenance (60 per cent). Just 24 per cent (see Figure 3) said they were doing so in order to overcome skills shortages, while a large minority of 47 per cent said they were embarking on digital transformation projects to be able to better deal with change.

William David Hartell, Director of Developments, Operations and Production at Stellae Energy Ltd., says: "With public health challenges and disrupted energy markets, it has become essential to manage operations more efficiently with fewer field personnel to save on OPEX costs. The use of central control rooms managing multiple field assets has becoming more widespread, while process and integrity data is being gathered by IoT devices."
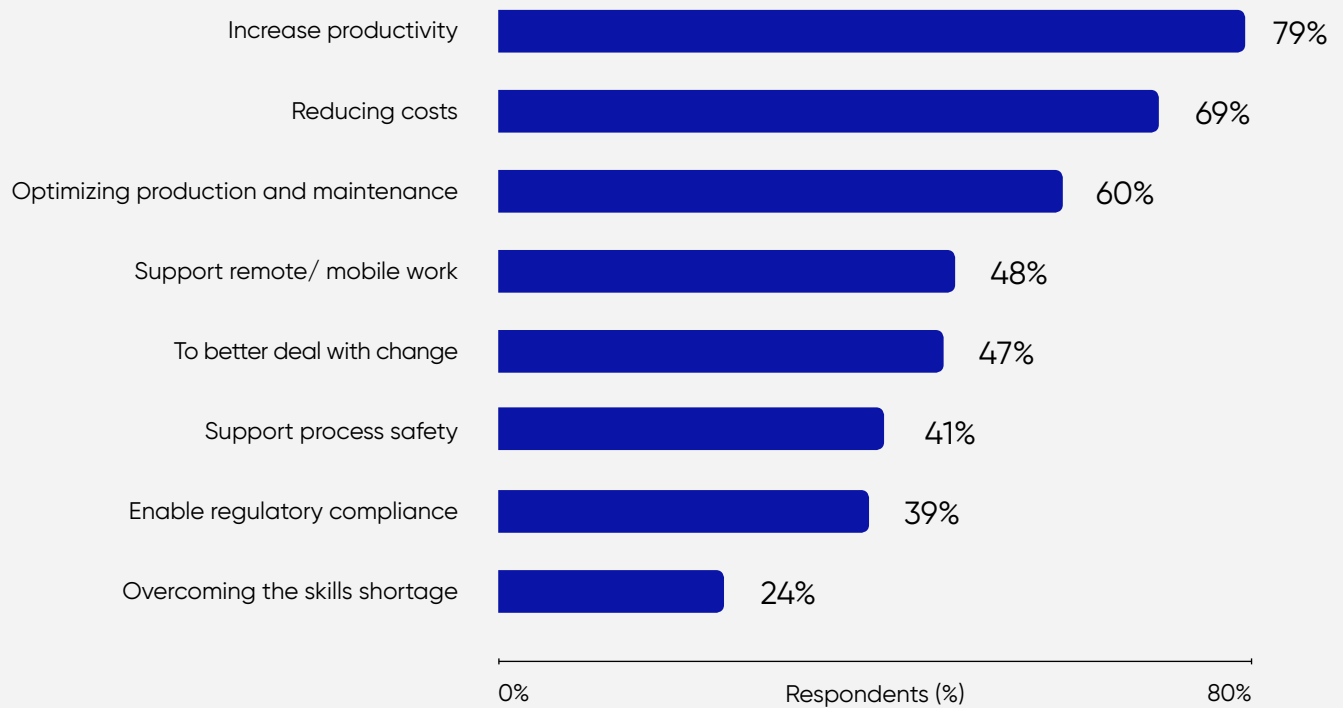
Businesses that utilize their data to improve collaboration are seeing smarter teamwork and more efficient decision-making throughout their ranks. Of all digitally available operations and workforce management solutions in use (see Figure 5), the vast majority of oil and gas organizations have been using them for standard operating procedures (69 per cent), work orders (68 per cent),

and piping and instrument diagrams (51 per cent). In terms of physical operations, the industry is demonstrating it is on track to utilize digital tools for more predictable outcomes.

Of all business processes organizations have automated, our survey reveals that logistics and supply chain leads the way with 46 per cent of respondents saying it has been implemented (see Figure 4). Training and development and asset performance management followed, both with 44 per cent. Digging deeper into what has already been automated (see Figure 5), the simpler tasks of shift management (29 per cent) and worker assignment (38 per cent) remain low on the priority list, meaning many companies are continuing to miss out on less labor-intensive opportunities to automate their workflows and improve efficiency.

Figure 3

What are the main reasons for the digital transformation of your operations?*

Increase productivity	79%
Reducing costs	69%
Optimizing production and maintenance	60%
Support remote/ mobile work	48%
To better deal with change	47%
Support process safety	41%
Enable regulatory compliance	39%
Overcoming the skills shortage	24%

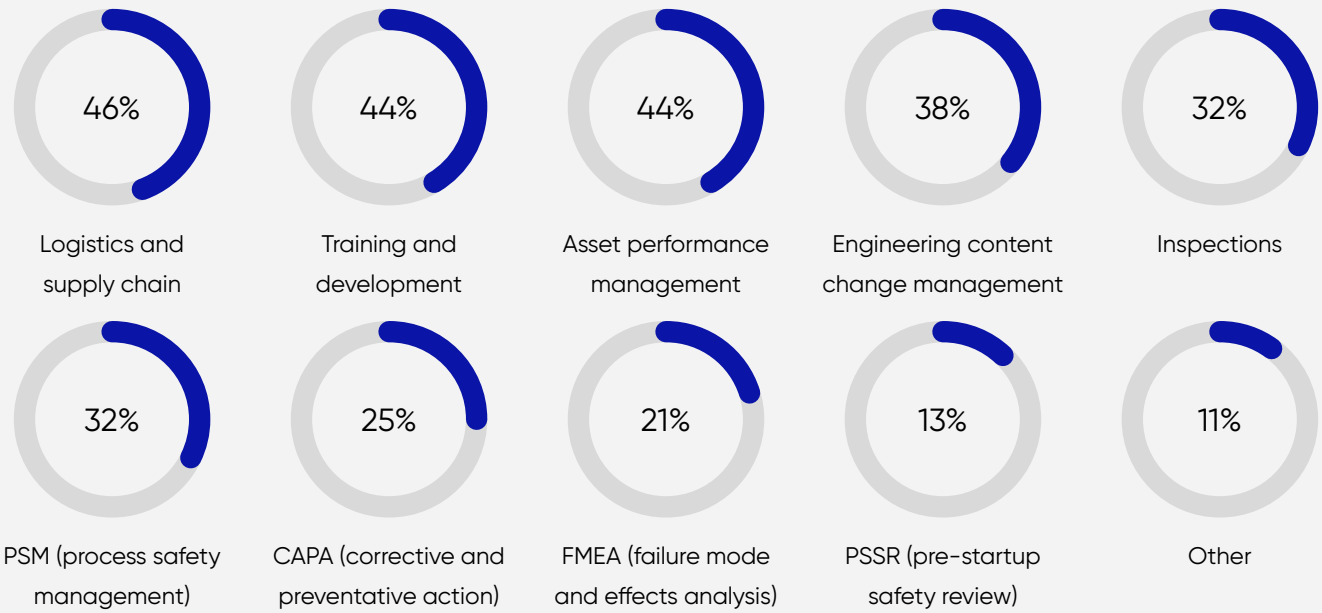0%   Respondents (%)   80%

*Respondents could select multiple answers

Source: *Intelligent Operations in Oil and Gas Survey 2020, Oil & Gas IQ*

Figure 4

Which of the following business processes has your organization automated?*

46%	**44%**	**44%**	**38%**	**32%**
Logistics and supply chain	Training and development	Asset performance management	Engineering content change management	Inspections
32%	**25%**	**21%**	**13%**	**11%**
PSM (process safety management)	CAPA (corrective and preventative action)	FMEA (failure mode and effects analysis)	PSSR (pre-startup safety review)	Other

Source: *Intelligent Operations in Oil and Gas Survey 2020, Oil & Gas IQ*

Figure 5

In respect to your operations and workforce management, which of the following are digitally available?*

Category	Respondents (%)
Standard operating procedures	69%
Work orders	68%
Inspection reports	51%
Piping and instrument diagrams	51%
Training and competences	51%
Operator logs	47%
Regulatory reports	44%
Worker assignment	38%
Shift management	29%

0%   Respondents (%)   70%

*Respondents could select multiple answers

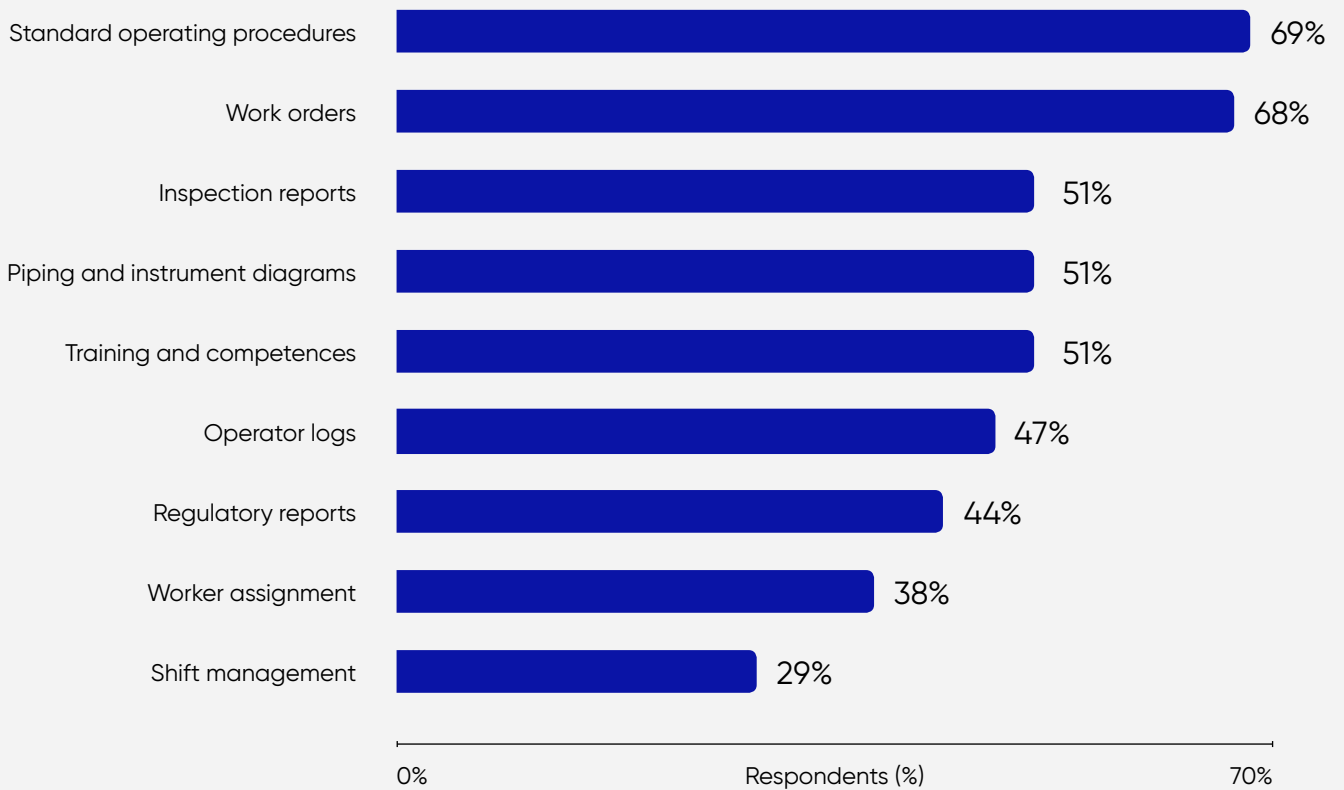**Source:** *Intelligent Operations in Oil and Gas Survey 2020, Oil & Gas IQ*

Emmanuel Udeh, Technical Data and Information Management Specialist and Subsurface Data Analyst at Shell Petroleum Development Company, Nigeria, says, "Data management, storage and administration are very critical for the success of any digital initiative. Data needs to be stored in the right place, be of the right quality and must be accessible to the engineers and analysts who require it for their digital deliverables. This will drive effective collaboration and integration, enhancing the quality of decisions underpinned by data.

"But as our world has been radically transformed due to the pandemic, organizations need to increasingly leverage digital channels to support the effectiveness of their workforces and remote workers," Udeh adds.

Among the technologies being utilized by oil and gas organizations to improve the efficiency of their operations, our survey reveals a broad mix (see Figure 4). Despite being a multiple selection question, none of the options were selected by a majority, suggesting organizations are taking their time in selecting the products and solutions available. This is especially the case on more specific process solutions such as PSSR (13 per cent), FMEA (21 per cent) and CAPA (25 per cent).

Whether the organizations surveyed provided operations with mobile access to critical operating data, 53 per cent are doing so, with 34 per cent failing to offer mobile access (see Figure 7). This is surprising says OpenText's Revelas, who remarks that despite "everyone having a smartphone or tablet, often we not using them in refineries or in the field".

"Mobile helps you to capture information," Revelas notes. "It should be embedded and ingrained within your business." Regarding the cost of mobile implementation, Revelas argues that organizations should weigh up the cost of not being able to make a decision.

"Mobility improves decision-making and shouldn't be considered as an option but a necessity," he asserts.

Along with the importance of mobility, where that content is stored is equally critical, with enterprise-scale solutions that are governed, secure and accessible within an organization, widely considered sensible options.

"One should be able to find their content in three minutes or less and that content should be trusted, as well as easy to find and digest," says Revelas. "But working with content that resides in silos degrades the value of an organization's decisions and increases operational risk."

According to Storymakers' Stawitz: "The maintenance of reliable access and protection of data serves as the primary concern over where important content is stored. This drives the point of why more executives should consider the benefits of storing certain content that has enterprise-wide or external application in a blockchain."

According to our survey, 51 per cent of organizations store their content on an organization-wide enterprise content management (ECM) system (see Figure 2), which Stellae Energy's Hartell says has historically been essential for document storage, management, organization and distribution.

"Organizations have found that multiple storage locations tend to lose track of revisions and even control of this documentation," Hartell adds. "To be compliant with internal and external requirements it has become essential to have an organization-wide ECM. Technologies and tools including IoT data, Blockchain and automation mean that new data and analytic streams need to be appropriately captured, indexed and made available for retrieval by internal and external users.

"Therefore, organization-wide ECMs become a good source of reliable information to provide to regulators, as well as funding and finance stakeholders."

The accessibility and storage of content is of huge importance to the operational performance of companies with just three per cent of our respondents describing it as "non-essential" (see Figure 8). In terms of whether it is business-critical, more than half (57 per cent) say it is – a n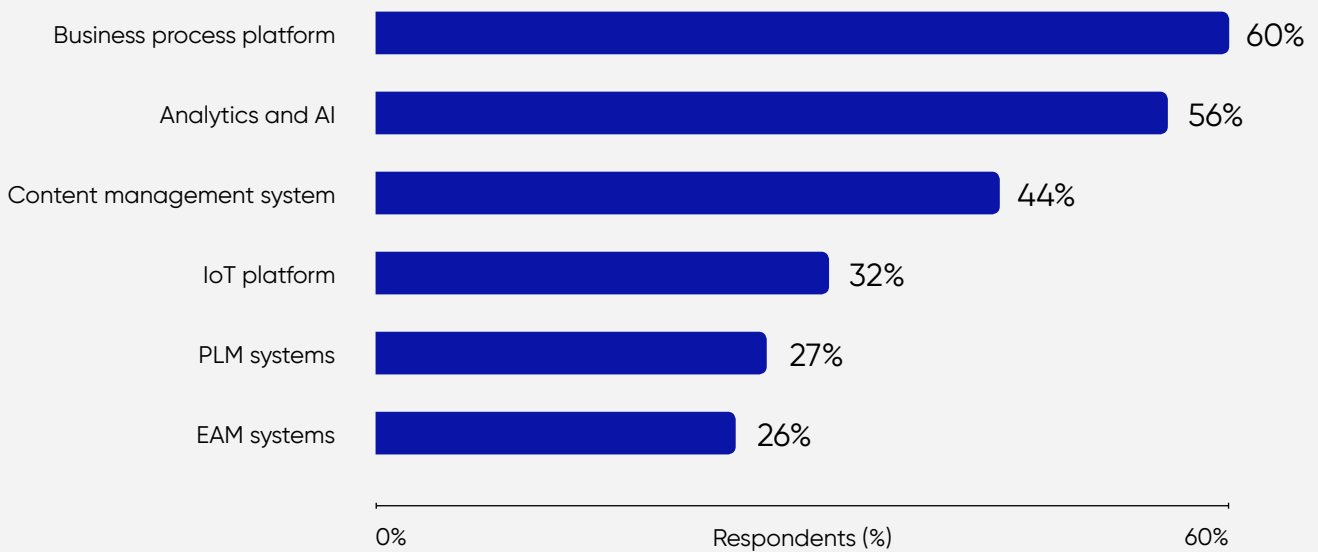umber set to grow rapidly in the coming years – with many survey respondents stating that content will be business-critical to operational performance within five years.

As Martin Richards, senior director and energy industry strategist at OpenText, observes: "Many operating companies are hampered by internal silos and a lack of managed integration between applications and databases across functional groups. Informed and connected workers get information to the right people at the right time, however, which enables companies to make safe and effective decisions."

Following the outbreak of Covid-19, those that were prepared for change found themselves in a better situation to deal with a pandemic that turned all industries on their head. The great hope, as we will see in part two of this report, is that the Covid-19 crisis and recent global pricing conflicts have led to improvements in industry collaboration and better data quality that will enable future automation.

Figure 6

Which of the following technologies improve the efficiency of operations?*

| Technology	Respondents (%)
Business process platform	60%
Analytics and AI	56%
Content management system	44%
IoT platform	32%
PLM systems	27%
EAM systems	26%

Respondents (%)

*Respondents could select multiple answers

Source: *Intelligent Operations in Oil and Gas Survey 2020, Oil & Gas IQ*

Figure 7

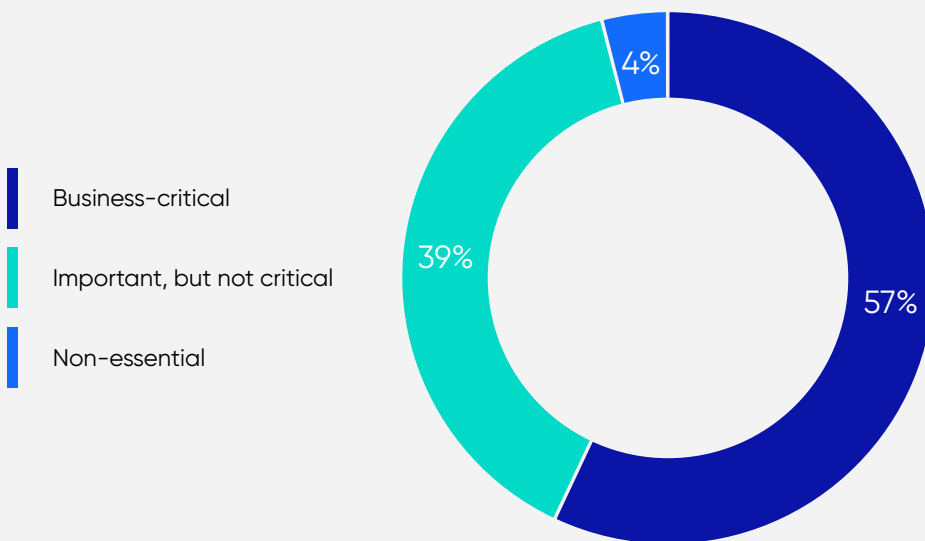**Does your organization provide operations with mobile access to critical operating data?**

- Yes
- No
- Not sure

53%
34%
13%
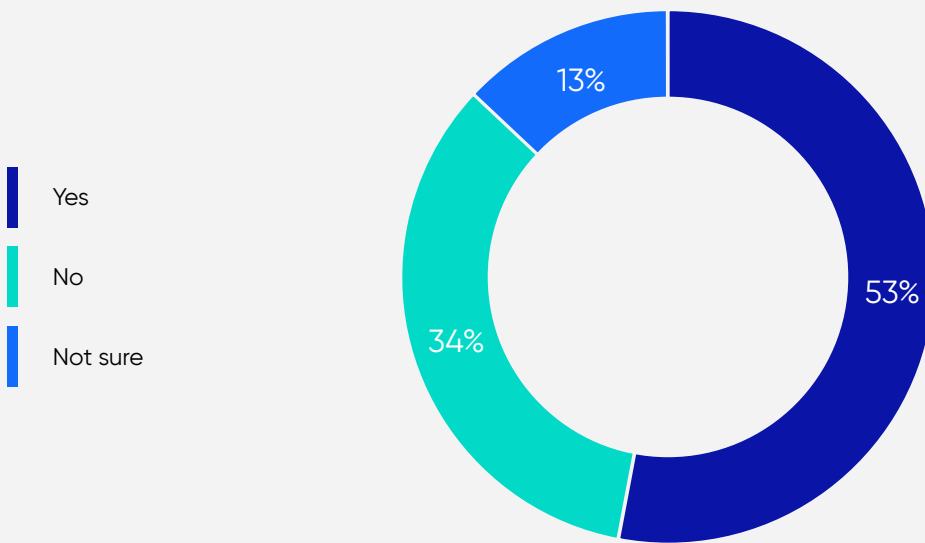
Source: *Intelligent Operations in Oil and Gas Survey 2020, Oil & Gas IQ*

Figure 8

Where do you consider your organization to be in its journey to Intelligent Operations?

- Business-critical
- Important, but not critical
- Non-essential

57%
39%
4%

Source: *Intelligent Operations in Oil and Gas Survey 2020, Oil & Gas IQ*

"Those who embraced digital solutions before the pandemic were able to double down and drive change in their organizations, so will likely see gains on operational efficiencies."

Nick Revelas

Future energy transformation strategy lead at OpenText
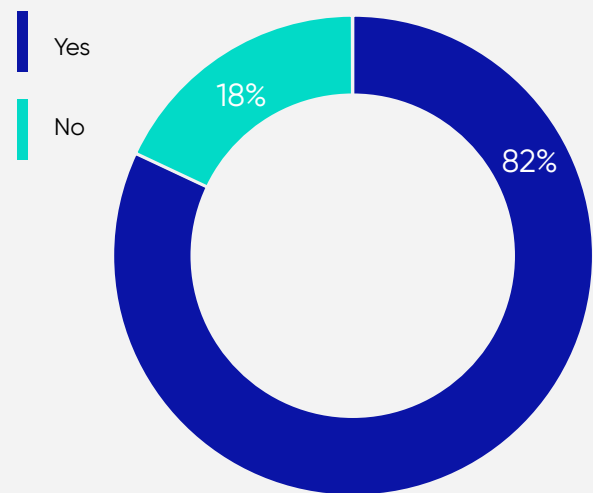
The impact of Covid-19 and looking ahead

Working from home has transformed the oil and gas industry, driving the adoption of digital transformation strategies and leading to improvements in workflow management efficiency. Among our survey respondents, 82 per cent said that said it had changed the way their organizations have addressed operational transformation (see Figure 9), with comments including "Covid-19 has justified the requirement of remote accessibility and security of all business systems"; "digitalization and travel restrictions have forced us to innovate and look to local suppliers"; and "the Covid-19 pandemic has changed the way our organization addresses employee safety and health, as well as operational transformation."

While it has helped many organizations enhance their focus on Intelligent Operations, it has also led to a grand revealing of many issues that had been previously obscured. It has also demonstrated the value of a creative and innovative workforce. "Remote working has probably worked much better than many had expected, but there are some constraints," Stellae Energy's Hartell warns. "Diverse teams working together may have creative challenges when not occasionally face to face and mind-mapping can often been more effective around a table or whiteboard scribbling ideas. We are trying to recreate these interactions virtually but it's not the same.

"New employees or transfers need to be indoctrinated into these teams and brought up to speed on the culture and ways of working," he adds. "Doing business with contractual counterparties or pursuing and capturing new business is also sometimes more difficult only with virtual interactions."

Covid-19 may have driven the uptake in digital transformation solutions, but the time to act was ahead of the crisis. As OpenText's Revelas asserts, "there have been many challenges for oil and gas throughout 2020–21, but it also presented an opportunity".

"Those who embraced digital solutions before the pandemic were able to double down and drive change in their organizations, so will likely see gains on operational efficiencies," Revelas adds. "Those that chose to hold back are now challenged in a remote manner of working that is unprecedented in the energy industry and will find themselves with disconnected information."

With the pandemic demonstrating the ability of many employees to perform work remotely, many elements of the workforce will be keen to continue this arrangement long after the pandemic has subsided. This may cause tensions within many traditional industries like oil and gas, with many managers keen to see a return to onsite operations where workers can be directly monitored.

Storymakers' Stawitz notes: "The challenge for executives will be to upgrade the skills of management to better oversee a remote workforce, but too many managers lack the ability to inspire and motivate workers even when they are onsite.

"Monitoring performance remotely instead of simply checking how many hours their subordinates spend on the clock requires a different mentality and an improved skill set," he warns.

Those operators that have demonstrated that they could be progressive before and during the pandemic will be the first to recognize the benefits of not forcing workers back into the office, while more traditional operations will see lower levels of employee engagement. As Stawitz recommends, it would be unwise to "force workers to return onsite when it has been demonstrated the work can be successfully performed remotely".

Figure 10

How did the Covid-19 pandemic change the way your organization is addressing operational transformation?

"There has been a widening of DCS remote monitoring."

"Many organizational inefficiencies have been identified."

"Digitalization and travel restrictions have forced us to innovate and look to local suppliers."

"Reducing site count for employees means we now rely on technology to connect subject matter experts with field workers."

"Virtual communications and work from home concepts are now more widely acceptable by all."

"As we adapted to the 'new normal', digital transformation reduced the required effort and increased productivity."

"We have reduced physical work hours and work mostly from home, which has increased production."

"The Covid-19 pandemic made all personnel aware and have no choice other than to intensively use mobile network in most aspects of their jobs."

"Supply chain lead time has increased and requires us to operate more effectively than ever before."

"It has increased the need to digitize our systems and allow remote access to key processes and information in order to be able to operate vessels."

"Covid-19 has justified the important requirement of remote accessibility and security of all business systems."

Source: *Intelligent Operations in Oil and Gas Survey 2020, Oil & Gas IQ*

In conclusion

From our extensive survey results, it is evident that the rise of the home worker has played a role in enabling the oil and gas industry to continue to function, as well as transforming attitudes toward the adoption of digital transformation strategies. Remote monitoring solutions are now more than a competitive benefit, as they fast become vital to workflow efficiency and site maintenance, with many of the businesses that have been able to withstand the storm created by the pandemic better utilizing data to improve collaboration, leading to smarter teamwork and efficient decision-making.

It is also evident that where organizations opt to store their content is of huge significance, while those that have adopted mobile as the go-to solution for onsite communication and workflow management are more likely to be the beneficiaries of a pragmatic approach to Intelligent Operations.

Looking ahead, oil and gas firms need to ensure they are continuously improving the way they work every day, with digital solitons playing a vital role.

"If an owner–operator in any asset-intensive industry is not already moving forward on or accelerating an enterprise cloud strategy, then they are already behind the curve," OpenText's Revelas remarks. "Cloud is already mainstream and is the only way to enable change, foster innovation and underpin any transformation." Companies such as OpenText are on hand to help energy companies accelerate business-led strategies that truly enable knowledge-based organizations.

"Don't over complicate or overthink the obvious," he advises. "Look at making a step change in your current way of working and factor in the creation of a digital thread of information, whatever that might mean to an organization."

And, finally, ensure executive alignment and that transformation of any type has strategic intent. It should always factor in operating culture by ensuring that human talent remains a critical part of any change strategy.

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