OCTAVE

WHITE PAPER

Five crucial steps to empowering field workers with the industrial internet of things (IIOT)

Introduction

The core of the industrial Internet of things (IIoT) is creating an ecosystem of sensors, detectors, automation, software and other big data analytics tools, which enable an accelerated, deep learning of existing operations.

It's about reversing knowledge drain and broadening knowledge sharing beyond human silos and making it accessible to all workers.

This has a range of strategic advantages for your organization and with the proper data integrations and solid information management, executives can make enterprise-wide operational improvements.

This white paper focuses on enhancing the productivity of your field workers by harnessing the power of IIoT. When implemented effectively in two critical areas – shift handover and mobility – the technology can reduce operational expenditures by 7% to 8%. Furthermore, it can help mitigate the impact of industrial accidents and reduce regulatory fines.

Why

Executive purpose

Even minor control failures and problems, when not promptly addressed, have the potential to escalate into significant risks that affect an entire organization and cause major, unplanned shutdowns. These hinder executives from achieving desired objectives, potentially even quarterly financial targets. Real-time monitoring and reporting of operations present a means to address issues of all sizes early and effectively.

On a macro level, one of the core principles of operations management is driving improvement and efficiency. Accordingly, operations executives are charged with finding, deploying and onboarding technological solutions that help remove roadblocks to business outcomes.

At the micro level, processes are often manual in immature organizations. This can range from having daily operation activities and plans mapped on a whiteboard to using Excel sheets to track incident reports. While Excel is an improvement over a whiteboard, without a controlled single source of truth, organizations realize only minor process improvements as the data is still siloed.

This phenomenon means crucial business information is accessible by only a few key employees. That knowledge is at risk of being lost as those workers approach retirement or leave for other roles. Operations leaders are charged with breaking down these knowledge silos and creating an environment where information can be easily shared across the workforce.

According to the Process Improvement Institute's report on "Human Factors Elements Missing from Process Safety Management," a staggering 99% of on-site fatalities originate from human errors. Additionally, 40% to 43% of industrial accidents are linked to manual process handovers. Strikingly, despite these statistics, approximately 45% of manual field workers still have limited exposure to technology.

Digitizing operations and transforming your workforce into "human sensors" can reduce field incidents and ensure regulation compliance. This approach minimizes your risk tolerance while improving overall safety and efficiency.

What

Long-term vision

Operations leaders who create a framework for using IIoT are well positioned to give themselves a competitive advantage within the next two years. General Electric reported in its Digital Industrial Evolution Index that 64% of power and utility companies, and 58% of manufacturing companies, will rely on IIoT as a core component of their digital transformation.

This means operation leaders must create a long-term vision by way of the short-term benefits gained by empowering field workers. It also means recognizing deficiencies and obstacles in processes that can be addressed with technology and transitioning the organization to a fully-integrated information management system that consistently transmits structured data to field workers, who, in turn, provide real-time feedback via mobile devices.

Embracing the implementation of IIoT will enable the realization of concepts like intelligent enterprise (IE), operational intelligence (OI) and predictive maintenance. Taking proactive steps to initiate these changes today is essential for industrial organizations that hope to maintain their competitiveness in the forthcoming decade.

Short-term vision

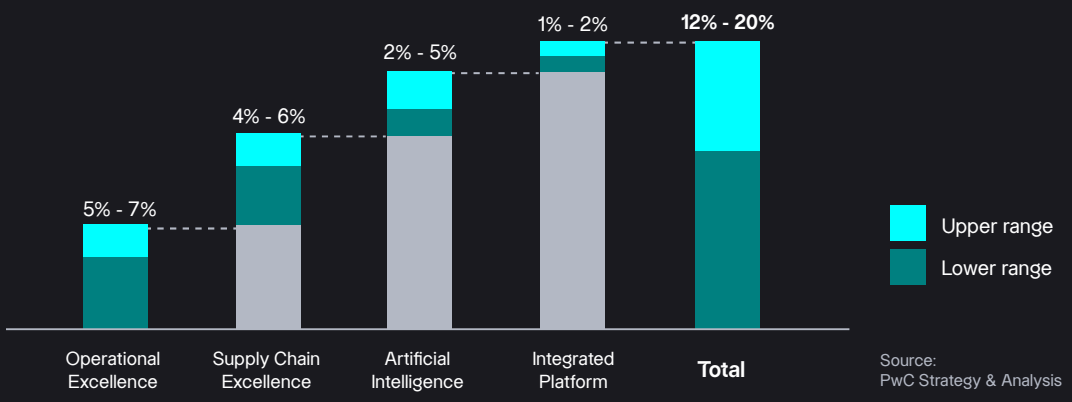
While concepts like IE, OI and predictive maintenance are relatively new and/or only now becoming functional, industrial businesses can still start seeing benefits from IIoT in the short-term. Elements such as mobile computing and information management have become commonplace and play a crucial role in implementing IIoT architecture.

For instance, a significant number of field workers own mobile devices and are comfortable using mobile applications. This makes software solutions one of the most accessible avenues for companies to leverage IIoT.

Consider this scenario: A field worker can use a mobile device to electronically log a problem, which then alerts the next shift about the issue. This process reduces the risk of problems going unreported due to manual errors. By creating a synchronized, single source of truth that all field workers access during their day-to-day operations, companies can achieve tangible business benefits in terms of productivity improvements and cost reductions.

Exhibit 1

Efficiency increase from digitization (% saving on total operating expenditure)



Source:
PwC Strategy & Analysis

How

How to manage change

Many organizations encounter challenges when it comes to effectively implementing technology and integrating it into their processes. Overcoming these barriers is crucial for success, and by following these five steps, your organization can navigate the path to IIoT success.

1. Start with the workers

Availability of digital skills is a concern to CEOs when it comes to:

- 61% concerned about the workforce
- 63% concerned about their senior leadership

Source: PwC: 21st Annual Global CEO Survey

Many workers and their leaders have concerns about the availability of digital skills and what is required to enhance their job performance. In this context, it's essential to prioritize the well-being and development of employees before focusing on productivity. Increased productivity naturally arises from boosting an employee's sense of worth and value within the organization. Engaged and empowered workers tend to be more productive.

Consider organizing a workshop that brings together field directors, operations and maintenance managers and other relevant stakeholders. During it, take the time to actively listen and discover what can genuinely assist them in performing their roles more effectively. This collaborative approach can yield valuable insights and foster a more productive work environment.

Align business strategy: Ensure that automation and digitization opportunities support the business strategy and layout a vision on where the company would like to be in five years. This will serve as a guide for identifying the necessary capabilities to execute the strategy effectively without overburdening it with unnecessary digitization efforts.

Design a future-fit workforce and workspace: Identify the field tasks that will be impacted by automation and digitalization. Assess the implications for jobs associated with these tasks and consider if they should be retained, phased out or merged with other roles. It's essential to proactively examine how the organization's culture should evolve in response to these changes.

Identify and close the skill gaps: Strike the right balance between reskilling, upskilling and repurposing the existing workforce and bringing in new skills, technology and knowledge as roles evolve to align with the new culture and strategy.

2. Identify with key performance indicators (KPIs)

What are the business objectives you hope to achieve through digitzing operations? For example, are you trying to maximize operating efficiency to reduce costs? Or trying to improve the health and safety of workers? Can digitizing and data collection open new sources of revenue by providing new services or products. Whatever they are, make sure they align to your KPIs.

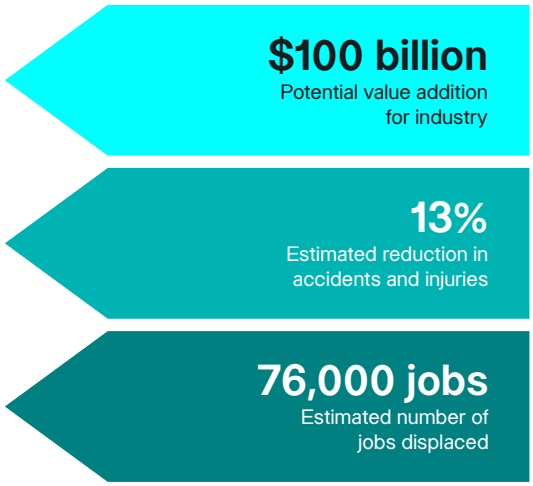
Four good yardsticks

1. What is being measured? Example(s): The percentage of field worker interactions that are virtual/digital.
2. Where are we today? Example(s): How many incidents are electronically logged or how many field workers use digital applications or devices?
3. What is our target goal? Example(s): Is this full digital adoption. Improved safety metrics. Better reliability or maintenance times.
4. What is our desired business outcome/benefit? Example(s): 100% incidents electronically logged and 8% lower operation cost.

NOTE: Your workforce is likely very knowledgeable about operations and maintenance but may struggle with the shift to digital. Consider training, hiring digital experts and/or bringing in vendors, while working with your human resources department to proactively foster a collaborative environment during the transition.

Value at stake: Connected Worker

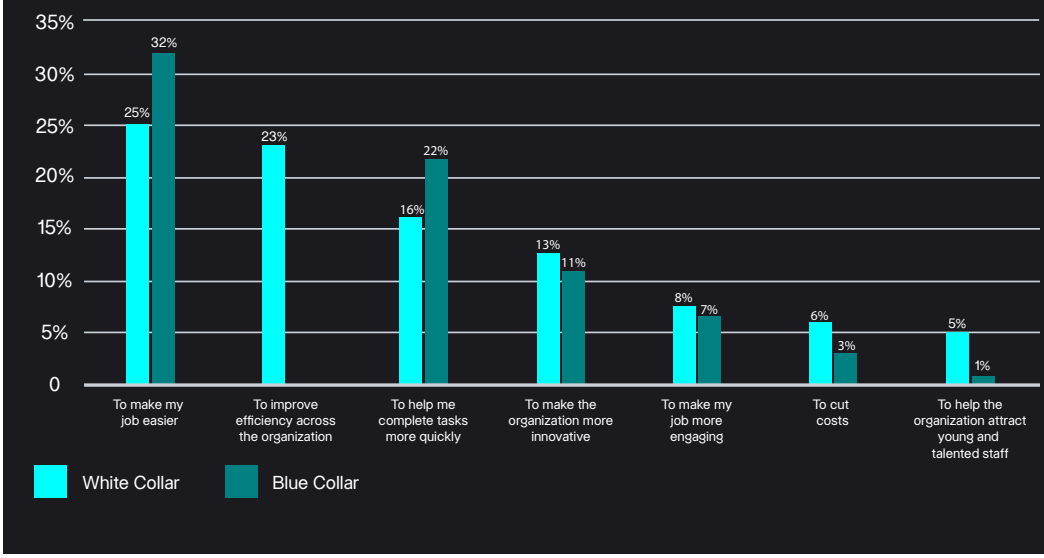
(All figures cumulative, 2016-2025)



World Economic Forum
Digital Transformation Initiative Oil and Gas Industry
January 2017

Figure 5

Preferred Impact of Technology



Examples of KPIs in four core areas of IIoT and operations

Safety

- Training (classroom or 1-on-1 mentoring)
- Employee audits and observations
- Near-misses
- Safety meetings (shift or company-wide)

Productivity

- Reduction in paperwork
- Time on tools
- First-time fix rate, mean-time-to-repair, backlog

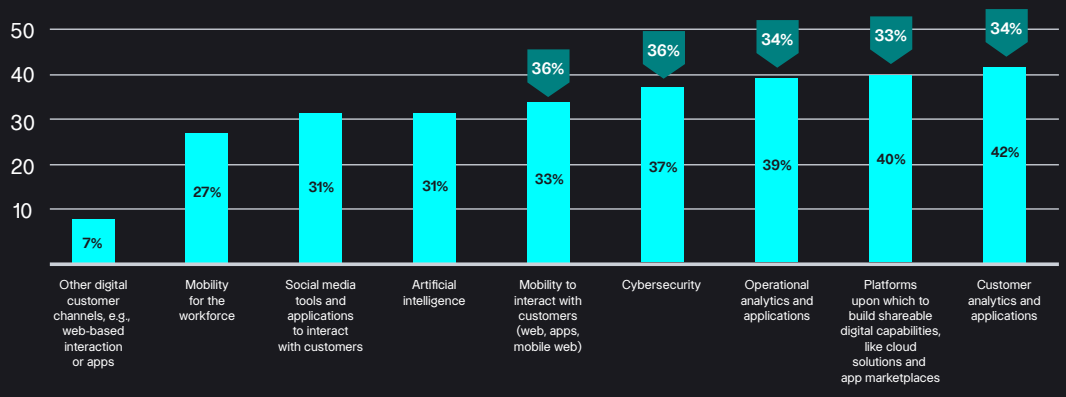
Reliability

- Overall equipment effectiveness or total effective equipment performance
- Maintenance cost / replacement asset value as a percentage
- Mean time between failures

Employee satisfaction

- Employee surveys
- How valued do they feel as an employee?
- How satisfied are they with their work/life balance?
- How do they feel about their career prospects?
- Employee net promoter score
- How likely is it that you would recommend working at our company to a friend or colleague? Generally, this question is answered on a scale from 0 to 10, where anyone answering 0 to 6 is considered a detractor, 7 and 8 is considered passive and 9 and 10 respondents are considered promoters.

For Asset-Intensive Companies*, the top five most promising digital technologies match the capabilities most in need of improvement



Base: All respondents

Digital technologies offering most potential for business transformation over the next five years
(Top five; in percentage)

Digital capabilities most in need of improvement
(Top five; in percentage of respondents indicating fair amount/a lot of improvement needed)

Asset Intensive Companies include companies from chemicals, oil and gas, metals and mining and utilites sectors
Source: Accenture 2016 Resources CIO Survey.*

3. Understand the environment

Lots of people have great solutions and ideas, but they aren't always realistic given the field or availability of resources. Scope the environment before deploying a solution. For example, in oil and gas industry, consider the conditions in which workers must carry out their jobs. Can they use their hands and access devices that require a light touch to operate or do they need a heads-up display? Are they working in dangerous or dark environments where conditions might affect the function or safety of their devices?

Likewise, it's crucial to map and comprehend existing processes. This involves identifying opportunities for optimization and pinpointing potential weak links that can be strengthened with technology. For instance, consider the scenario of shift handover: identify any obstacles to incident reporting or log keeping and enhance them by implementing mandatory updates through software.

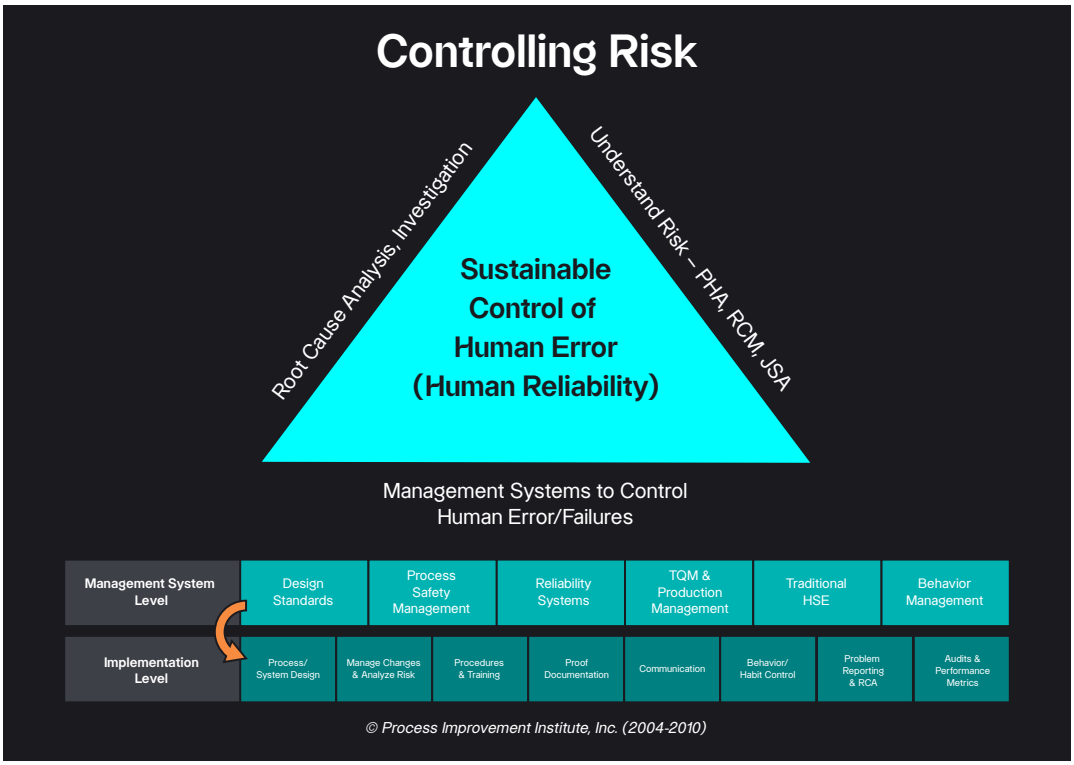
Before embarking on digitalization efforts, it's essential to gain a comprehensive understanding of the current operational reality and its nuances.

4. Unite your data, manage your information

To assess the maturity of your organization to empower field workers, consider asking these key questions:

For empowering field workers

- Can existing information in our environment be pushed to devices to help field workers perform their tasks more effectively?
- Are all members of the workforce operating from a unified instance or are we duplicating efforts and/or working in silos?
- Can manual or hardcopies be uploaded into a digital environment?
- Can all this information be accessed through one platform?



For reporting

- How can we leverage data from our existing assets and introduce new data sources to enhance value delivery in the previously identified cases?
- Can the data be easily managed to create executive reports on an almost real-time basis?

For information management maturity

- Do we have the internal expertise required to consolidate our information into a unified source of truth, or should we consider engaging a consultant specializing in information management /data integration?
- How secure is our information and are we protected from external threats, such as malware, spoofing and theft?
- In terms of accessibility, if a plant were to burn down today, would we be able to compile the information required to rebuild it tomorrow?

5. Bring it together

Involving workers early in the process ensures we're developing technology and enabling workers in a way that's realistic and comfortable for them to adopt. Begin with a small-scale pilot of an idea to promote learning and refine the approach before progressing to larger-scale implementation.

Leveraging solutions for controlling risk and worker productivity

Depending on your organization's maturity, you may want to look at your operations management system and implementation levels.

Operations information management issues

If you're grappling with issues related to accessing information and reporting, or facing credibility issues with your risk and productivity data, your initial hurdle is to introduce a dependable operations management system into your organization. This entails conducting an audit of your existing system to ensure the seamless integration of process safety, reliability, product management and worker behavior.

Octave (formerly Hexagon) specializes in assisting organizations to diagnose these challenges and our asset lifecycle information management and performance management solutions ensure that your information flows efficiently across your architecture to the correct destination when it's needed.

Implementation issues

Organizations grappling with visibility issues, low productivity or a high occurrence of unforeseen accidents may need to optimize their implementation level. This enhancement should complement a robust operations management framework and necessitates the use of operations management software.

Organizations in need of this software often encounter challenges related to worker mobility and productivity, substantial vendor configuration expenses or complexities in expanding operations throughout the entire enterprise. Octave Tempo Shift Handover (formerly j5 Shift Handover) specializes in addressing these challenges, helping organizations overcome them and move closer to achieving genuine operational and shift excellence.

High-maturity enterprise solutions

After optimizing management systems and implementation levels, mature organizations can explore enterprise-wide solutions that integrate seamlessly with existing platforms. These solutions enable companies to progress toward predictive maintenance, mobility management and enterprise intelligence by leveraging advanced platforms.

About Octave

Octave is a leader in enterprise software, turning data into decisive action and intelligence into your edge. Our software solves for and simplifies complexity, from the design and build to operations and protection of people, property, and assets– for any scope, at any scale. For decades, we've partnered with customers to sharpen performance, elevate efficiency, and amplify results. From factory floors to entire cities, our solutions are tuned to scale up what's possible from day one onward.