NUCLEUS
RESEARCH

The frontline execution gap in manufacturing and distribution

DOCUMENT

26085

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Overview

In a survey of 400 manufacturing and distribution leaders, Nucleus identified a clear and measurable divide in frontline execution performance. Companies that have adopted a broader set of digital frontline practices consistently outperform their peers across workforce readiness, operational consistency, and financial outcomes.

Nucleus surveyed 400 frontline and operational leaders to assess how organizations deliver, manage, and digitally enable frontline execution across manufacturing and distribution environments.

To evaluate this gap, Nucleus segmented organizations based on adoption of five core digital frontline practices: work instruction delivery, training, real-time guidance access, skills and certification tracking, and task completion with compliance verification:

> ***Leading Adopters (29.5 percent)****: Organizations with four or more practices in place, operating with a structured and digitally supported execution model*
>
> ***Partial Adopters (63.5 percent)****: Organizations with one to three practices, where frontline execution remains fragmented across systems and processes*
>
> ***Non-Adopters (7 percent)****: Organizations with no digital frontline practices, relying on manual, paper-based, or verbal methods and exhibiting the weakest performance across all measured areas*

Leading Adopters are nearly five times more likely to leverage digital on-the-job training (49 percent versus 10 percent), enabling more consistent and scalable workforce development. As a result, more than 70 percent of new hires reach full productivity within four weeks, compared to longer, more variable ramp times at other organizations.

This gap extends beyond training into day-to-day execution. Nearly 70 percent of Partial Adopters report measurable performance impacts from inconsistent frontline execution, indicating that fragmented processes remain a persistent constraint on productivity and margin. In contrast, organizations with more mature execution models are significantly better positioned to standardize work, reduce variability across teams, and sustain operational improvements over time.

Analysts found that organizations with more mature frontline execution practices consistently outperform peers across training, execution consistency, and operational outcomes.

The impact of this divide is reflected in measurable business outcomes. Leading Adopters report a 20 percentage-point advantage in productivity improvements (81 percent versus 61 percent), alongside reductions in downtime and rework. They are nearly twice as likely to report improved employee retention (45 percent versus 25 percent) and 1.5 times more likely to realize compliance and audit gains (48 percent

versus 33 percent). Improvements in on-time performance (46 percent versus 40 percent) further highlight the downstream impact on customer-facing operations.

Leading Adopters are five times more likely to leverage digital on-the-job training (49% vs. 10%), enabling more consistent and scalable workforce development.

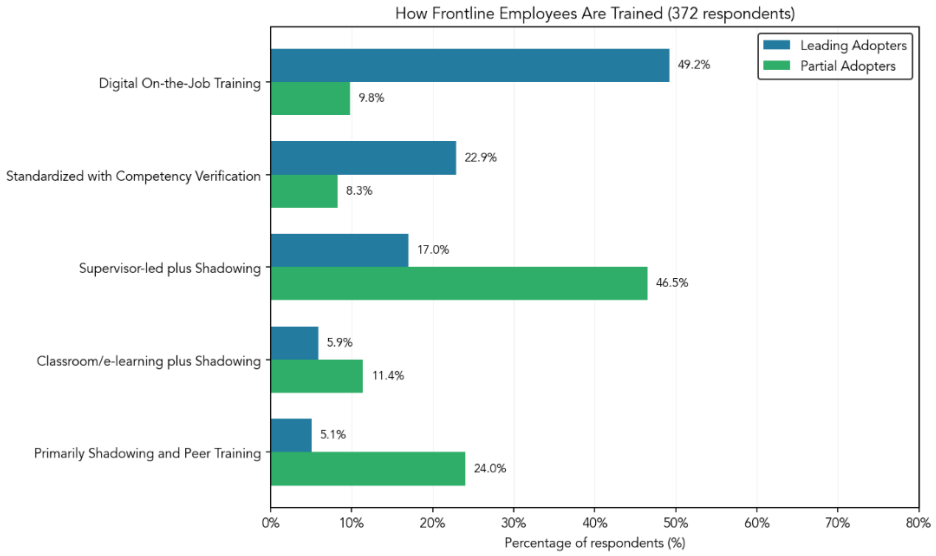
A single capability does not drive these differences; rather, it is the effectiveness with which organizations connect training, task execution, and compliance into a unified execution model. Organizations that have established this foundation operate with greater consistency, control, and scalability, while those relying on fragmented tools and informal processes continue to face constraints in workforce readiness, process standardization, and overall performance.

This report examines how this execution gap manifests across four key areas: workforce readiness, operational consistency, process formalization, and Return on Investment (ROI) and value realization.

Workforce readiness

Workforce readiness reflects how effectively organizations prepare frontline workers to perform their roles, including how training is delivered, how quickly employees reach productivity, and how easily they can access guidance during execution.

More than 70% of Leading Adopters bring new hires to full productivity within four weeks, compared to longer and more variable ramp times for Partial Adopters.



As one of five core practices used to assess frontline execution maturity, training plays a foundational role in enabling the broader execution model, influencing how effectively organizations can standardize work, track performance, and respond to operational issues. Partial adopters continue to rely heavily on supervisor-led training and shadowing-based

approaches, as one respondent noted: "Training isn't standardized, it depends on who trains you." Nucleus found that 46.5 percent primarily use supervisor-led instruction combined with shadowing, and another 24 percent primarily use peer-based training.

Some organizations have introduced classroom or course-based e-learning to supplement these approaches, representing a step toward more structured training. However, this model remains disconnected from the point of work, limiting its effectiveness in operational environments where employees must apply knowledge in real time. Without direct linkage between training and execution, workers often revert to peer guidance or personal interpretation when performing tasks, reducing consistency across teams. This dynamic is particularly pronounced in high-volume manufacturing lines and distribution centers, where repeatability and speed are critical to maintaining throughput and quality.

Partial Adopters continue to rely on informal training methods, with over 70% using supervisor-led or peer-based approaches that limit consistency and scalability.

In environments where training depends on experienced workers or is disconnected from execution, knowledge transfer becomes inconsistent by design. Individual operators, technicians, and supervisors may communicate processes differently or emphasize different priorities based on personal experience. As organizations scale operations, add new hires, or expand across shifts and locations, these inconsistencies compound. In many cases, this informality extends beyond training itself, creating multiple layers of variability with no consistent reinforcement system. The result is a workforce that may be trained, but not uniformly prepared to execute tasks to the same standard, limiting the organization's ability to accelerate onboarding and respond consistently to changing operational requirements.

This risk becomes more pronounced in organizations without any digital frontline systems, where knowledge transfer relies almost entirely on peer-based training and informal communication. In these environments, nearly half of workers resort to unscripted problem-solving when issues arise, reinforcing that training is not consistently translating into executable knowledge at the point of work.

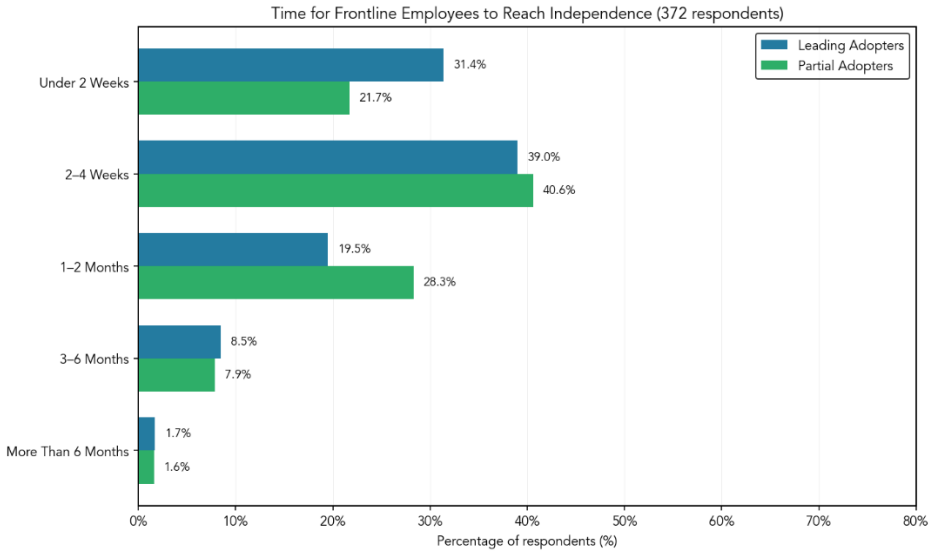
"Workforce readiness is no longer defined by whether employees are trained, but by how consistently and quickly they can apply that training during execution."

Additionally, Leading Adopters take a more structured approach by embedding digital on-the-job training and standardized training with competency verification into frontline workflows. Nearly half of Leading Adopters (49.2 percent) rely on digital on-the-job training, compared to just 9.8 percent of Partial Adopters, and they are nearly three times as likely to implement standardized training with competency verification (22.9 percent versus 8.3 percent). While some may still incorporate

shadowing as part of the onboarding process, it is supplemented by systems that deliver consistent instruction, track completion, and validate performance.

Leading organizations are nearly 2x more likely to adopt new processes permanently post-go-live.

This enables organizations to confirm not only that training was delivered, but that it was understood and applied correctly, reducing variability in execution and lowering the risk of errors, rework, and non-compliance. By linking training directly to execution, organizations can ensure that workers are qualified before performing tasks, enforce standard work more consistently, and reduce reliance on supervisor oversight. The result is a more controlled, repeatable approach to workforce development that improves operational consistency and performance outcomes.



The differences in how organizations train frontline workers translate directly into how quickly new hires reach independent productivity. In manufacturing and distribution environments, time to competency is not a secondary metric. It is a core operational constraint that impacts throughput, labor efficiency, and the ability to meet demand. More than 70 percent of Leading Adopters report that new hires reach independence within two to four weeks or less, including 31.4 percent in under two weeks. Partial Adopters are less concentrated in these faster ramp timelines, with only 21.7 percent reaching independence within two weeks and a greater share falling into the one- to two-month range. Several respondents tied this directly to hiring constraints, noting that "Onboarding depends on who's available to help." Through end-user conversations, Nucleus found that a high-volume packaging manufacturer reduced time to full operational competency by 58 percent by replacing static documentation with task-based training and

embedded guidance, enabling faster onboarding and more consistent execution across shifts.

Leading organizations are nearly 2x more likely to adopt new processes permanently post–go–live.

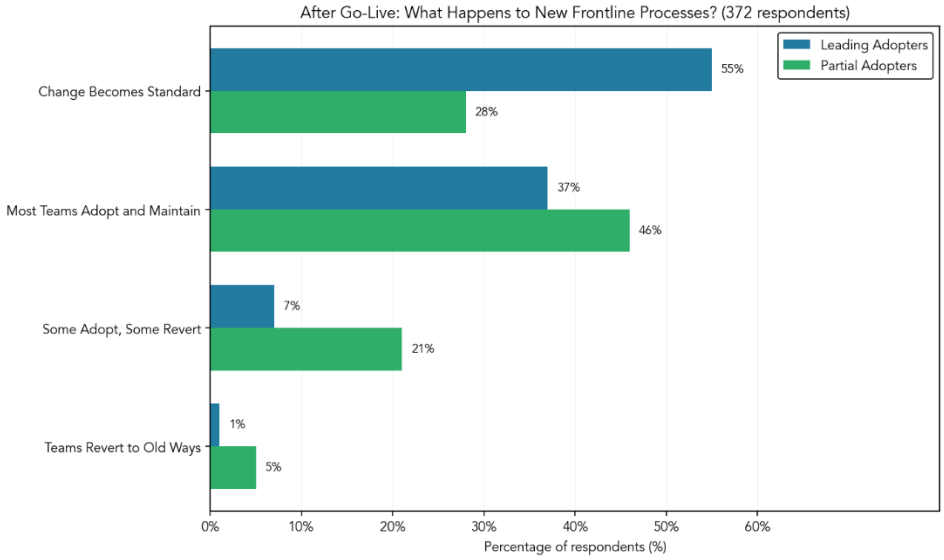
At a surface level, these differences may appear modest. However, in operational environments where production lines, warehouses, and distribution networks are constantly in motion, even incremental delays in ramp time compound quickly. Each additional week required to bring a worker to full productivity extends reliance on experienced employees, increases supervision requirements, and limits the organization's ability to flex capacity in response to demand. This effect is amplified when workers are unable to access timely guidance during execution. More than half of Partial Adopters report delays of 15 minutes or more when workers encounter an issue, compared with a significantly smaller share of Leading Adopters. In some cases, limited access to guidance creates a direct risk, with 18.1 percent reporting that workers resort to trial-and-error, compared with 3.4 percent among Leading Adopters. For organizations without digital training or guidance systems, the challenge is greater: most rely on shadow-based onboarding, and half of new hires require more than one month to reach independence, reducing labor flexibility and responsiveness to demand.

These differences are closely tied to how training is structured and delivered. Organizations that rely on informal or supervisor-led methods often see ramp time vary based on who is available to train, how consistently processes are communicated, and how quickly new hires are exposed to real scenarios. In contrast, organizations that embed training into the flow of work, supported by standardized guidance and competency validation, create a more repeatable path to independence. New hires can access the same instructions, follow consistent processes, and build confidence more quickly, regardless of shift or location. The result is not simply faster onboarding, but more predictable onboarding. Leading Adopters are better positioned to scale their workforce, absorb turnover, and maintain performance under changing conditions because they can consistently bring workers up to speed within a defined window. In contrast, organizations without structured training systems lack a defined path to independence, leaving workforce readiness dependent on individual experience rather than controlled by processes. Analysts interviewed a manufacturer that used its connected worker solution to embed instructional videos and searchable procedures on devices, enabling technicians to resolve equipment issues independently during overnight shifts and reducing reliance on a limited number of experienced personnel.

Operational consistency

Operational consistency reflects how reliably work is executed across individuals, shifts, and locations, and whether process changes are sustained over time.

Partial Adopters face a structural execution gap, with over 25% reporting inconsistent or failed adoption, creating variability that directly impacts quality, throughput, and compliance.



Leading Adopters are significantly more effective at turning process improvements into standard practice. A majority (55 percent) report that new frontline processes become the standard after go-live, compared to just 28 percent of Partial Adopters. For Leading Adopters, changes are not treated as one-time initiatives but are embedded into daily operations to ensure they are consistently followed over time. This advantage extends beyond post-go-live adoption. More than half of Leading Adopters (54.5 percent) report that at least 76 percent of their operational change initiatives meet their intended goals, compared to just 36.2 percent of Partial Adopters. At the same time, nearly 30 percent of Partial Adopters report that only 50 percent or fewer of their improvement initiatives achieve their intended goals, suggesting a higher incidence of stalled, failed, or underperforming change efforts.

Leading Adopters are significantly more successful at sustaining change, with over half reporting that at least 76% of initiatives achieve intended outcomes.

Partial Adopters, by comparison, are far more likely to experience execution fragmentation. Only 28 percent report that new processes fully become the standard after go-live, while 46 percent say most teams adopt and maintain them. This suggests many organizations achieve localized progress without enterprise-wide standardization. An additional 21 percent indicate that adoption is inconsistent, with some teams following new processes while others revert to previous methods, and five percent report that teams fully return to old ways after go-live. Together, this means that the majority of Partial Adopters do not

achieve full standardization, as one respondent noted, "We have processes, they're just not followed the same way," limiting the effectiveness of process improvements and creating variability across operations. This breakdown becomes more pronounced in organizations without any digital frontline infrastructure, where more than one-third of process changes either fragment across teams or fail to sustain after implementation. In these environments, there is no consistent mechanism to reinforce new ways of working, and process adoption depends almost entirely on individual behavior rather than system-driven execution.

"The ability to make process changes stick, not just launch them, is what separates organizations that improve from those that stall."

In manufacturing and distribution environments, this inconsistency creates measurable operational risk. When processes are not followed uniformly, outcomes vary across shifts and locations, making it difficult to maintain quality, throughput, and compliance. This variability is reflected in task execution itself. Nearly half of Leading Adopters (49.2 percent) report highly consistent task performance across their workforce, compared to just 26.4 percent of Partial Adopters. While most organizations report at least moderate levels of consistency, Partial Adopters are more than twice as likely to describe execution as only somewhat consistent, indicating noticeable variation in how work is performed across teams. As one respondent described it, "Everyone does things slightly differently." Supervisors are often required to intervene to maintain alignment, which increases operational overhead and limits scalability. Over time, this variability erodes the impact of improvement initiatives, forcing organizations to continuously reintroduce or reinforce changes rather than building on a stable foundation. It also limits the organization's ability to scale efficiently.

When execution varies by shift, site, or team, manufacturers and distributors cannot increase output, introduce new processes, or absorb growth without adding more oversight and supervision. Nucleus observed that an automotive distributor improved execution consistency by introducing real-time task tracking and procedural acknowledgment, enabling managers to verify completion and standardize work across frontline teams.

When frontline execution lacks consistency, supervisors are often forced to intervene to maintain alignment, which increases management overhead and limits the organization's ability to scale efficiently.

The impact of this inconsistency is not theoretical. Most Partial Adopters (69.3 percent) report that inconsistent frontline execution has a moderate, significant, or severe impact on operational performance. While Leading Adopters also report some level of impact, they are significantly more likely to describe it as minor and manageable, indicating greater control over execution variability. For Partial Adopters, inconsistency is not an isolated issue but an ongoing

constraint that limits their ability to operate efficiently and scale effectively. It creates downstream pressure on labor productivity, rework, throughput, and the organization's ability to sustain margin as operations grow.

Nearly 70 percent of Partial Adopters report measurable performance impacts from inconsistency, indicating that fragmented execution is a persistent drag on productivity and margins.

The difference between these groups reflects more than the adoption of individual practices. It reflects whether organizations have established the underlying infrastructure required to enforce standard work. Leading Adopters are better positioned to sustain change because they have integrated training, guidance, and task execution into a consistent system that supports frontline workers in following the correct processes. This allows organizations to move forward with greater confidence, knowing that new processes will be adopted consistently and maintained over time.

Partial Adopters, in contrast, often lack this level of reinforcement. Even when new processes are introduced, they rely on individual adherence rather than system-driven consistency, making outcomes more dependent on people than process. For organizations operating in fast-paced production and distribution environments, this is not sufficient. Consistency is what enables efficiency, reduces rework, and creates the conditions for scalable growth.

Ultimately, the ability to make process changes stick is what separates incremental improvement from sustained operational performance. Organizations that can consistently turn new processes into standard practice are better positioned to drive efficiency gains, reduce costs, and scale operations.

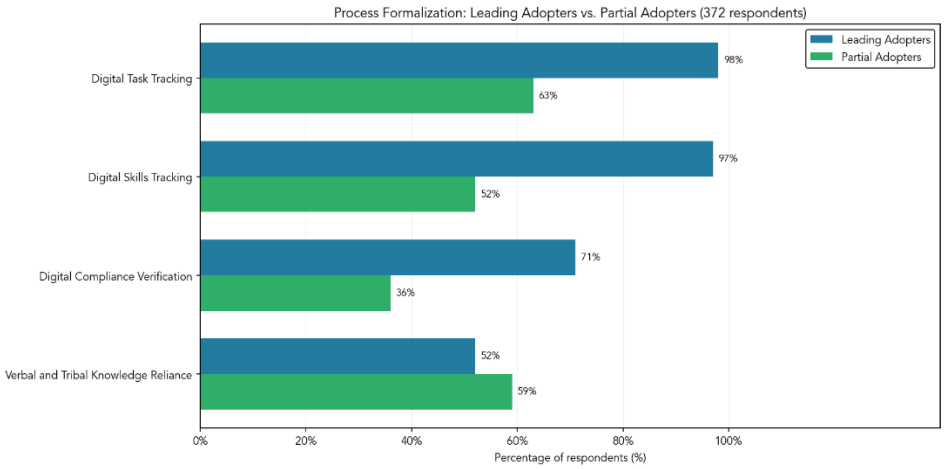
Process formalization

Process formalization reflects the extent to which frontline work is structured, tracked, and consistently enforced across the organization, whether through digital systems or manual methods. Digital tools significantly improve scalability, visibility, and control.

Leading organizations have operationalized frontline execution, with near-universal adoption of digital task and skills tracking, creating a system-level connection between work assignment, qualification, and execution.

The foundation of process formalization begins with systems that define, assign, and track work. Leading Adopters have largely established this foundation, with near-universal adoption of digital task tracking (98 percent) and digital skills tracking (97 percent), as well as significantly higher levels of digital compliance verification (71 percent vs. 36 percent for Partial Adopters). These systems create a centralized structure for managing frontline work, ensuring that tasks, qualifications,

and execution requirements are visible and consistently applied across the organization.



Partial Adopters continue to rely on fragmented systems, with over 40% lacking integrated skills tracking and 36.6% lacking task tracking, limiting visibility into who is qualified and whether work is completed.

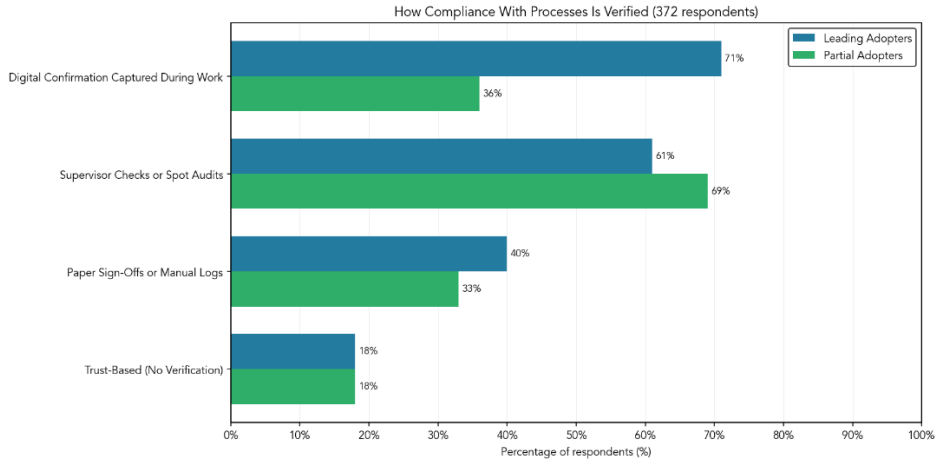
Partial Adopters exhibit clear gaps across these areas. Just over half (52 percent) report using digital skills tracking, and fewer than two-thirds (63 percent) use digital task tracking, indicating that critical elements of frontline execution remain disconnected. At the same time, reliance on verbal or tribal knowledge remains high (59 percent), reinforcing that institutional knowledge is often held by individuals rather than embedded within systems. As one respondent put it, "We rely too much on tribal knowledge." Among Partial Adopters, 41.3 percent track skills only in spreadsheets or HR systems with no digital linkage to actual work assignments, compared to just 3.4 percent of Leading Adopters, and an additional 6.3 percent do not formally track skills at all. In these organizations, there is no system connecting worker qualifications to the tasks they are assigned, so compliance with certification and training requirements is managed manually, if at all. Nucleus found that a consumer goods manufacturer formalized workforce capability by linking SOP compliance and skill progression to defined job roles, improving visibility into training completion and ensuring compliance requirements were consistently met.

As one respondent noted, "Maintenance requests are informal," reflecting a broader issue: without digital task systems, frontline execution often depends on memory, manual follow-up, and reactive management.

Additionally, the gap is not just in how skills are assigned, but also in whether task execution is tracked and verified through completion. Digital task systems provide visibility into task status, completion, and accountability at the individual worker level. This enables supervisors and operations leaders to understand not just what was assigned, but what was actually completed, when, and by whom. For a significant portion of Partial Adopters, this visibility does not exist. In fact, 36.6 percent of Partial Adopters report having no digital task tracking at all. In these environments, there is no reliable mechanism to confirm whether assigned work has been completed beyond manual follow-up

or supervisor oversight. As a result, task execution becomes dependent on individual memory, informal communication, and reactive management rather than system-driven accountability. In some environments, even support workflows remain informal. As one respondent noted, "Maintenance requests are informal." Without a system that connects task assignment to execution, organizations cannot consistently ensure that standard work is followed, deviations are identified, and performance is measured. This breakdown is most evident in organizations without digital frontline systems, where organizations lack visibility into qualifications, task assignment, or execution outcomes. In these contexts, there is no framework linking worker qualifications to assigned tasks or validating whether work was completed correctly, leaving execution dependent on manual coordination and individual judgment. Through end-user interviews, Nucleus found that one healthcare distributor consolidated fragmented maintenance documentation into a centralized platform, enabling standardized access to procedures and training materials across more than 250 technicians.

"Without a system that connects skills, tasks, and compliance, execution remains dependent on individuals, limiting consistency, increasing risk, and constraining scalability."



The final component of process formalization is how organizations verify that work has been completed correctly and, just as importantly, whether it was completed in accordance with defined SOPs and documented procedures. This is where execution shifts from activity tracking to true operational control.

When frontline work is not executed consistently according to documented procedures, defects, incomplete tasks, and process deviations are more likely to move downstream unnoticed.

Leading Adopters are far more likely to verify compliance through digital confirmation during work (71 percent vs. 36 percent of Partial Adopters), enabling real-time validation that tasks have been completed according to standardized procedures. This creates a closed-loop execution environment where work is not only assigned digitally, but also validated against defined SOPs at the point of

execution. In manufacturing and distribution environments, this ensures that critical steps, checks, and handling requirements are consistently followed, reducing the risk of deviations from standard work. Nucleus spoke to one distributor that used real-time reporting on training completion and procedural acknowledgment to assess compliance following operational incidents, reducing the time required to identify and correct gaps.

Digital compliance verification is a key differentiator: 71% of Leading Adopters validate work in real time, compared with 36% of Partial Adopters, enabling consistent enforcement of standard work and reducing execution variability.

Partial Adopters, by comparison, continue to rely heavily on supervisor checks and spot audits (69 percent), paper-based logs (33 percent), and, in some cases, trust-based verification with no formal validation (18 percent). Nearly half of Partial Adopters (47.2 percent) rely on supervisor checks as their primary compliance method with no digital verification layer, compared to 22.0 percent of Leading Adopters. In these environments, compliance is often interpreted rather than enforced, with workers relying on memory, experience, or informal guidance to follow procedures. As a result, adherence to SOPs can vary by individual, shift, or location. This variability is amplified in organizations without digital verification mechanisms, where compliance is often based on trust or informal checks rather than validated execution. In these environments, adherence to SOPs cannot be consistently enforced, increasing the likelihood of undetected deviations during production or fulfillment.

The operational consequences are significant. When work is not consistently executed according to documented procedures, defects, incomplete tasks, or process deviations are more likely to occur and move downstream unnoticed. For manufacturers, this can result in nonconforming products, scrap, rework, and quality escapes, all of which impact production efficiency and costs. For distributors, it can lead to picking errors, improper handling, labeling mistakes, and shipment inaccuracies that drive returns, service failures, and reduced customer satisfaction. In each case, the failure is not just that work was completed incorrectly, but that it was not executed in accordance with the defined standard.

"Organizations that reduce execution variability are the ones that consistently convert operational improvements into measurable financial outcomes."

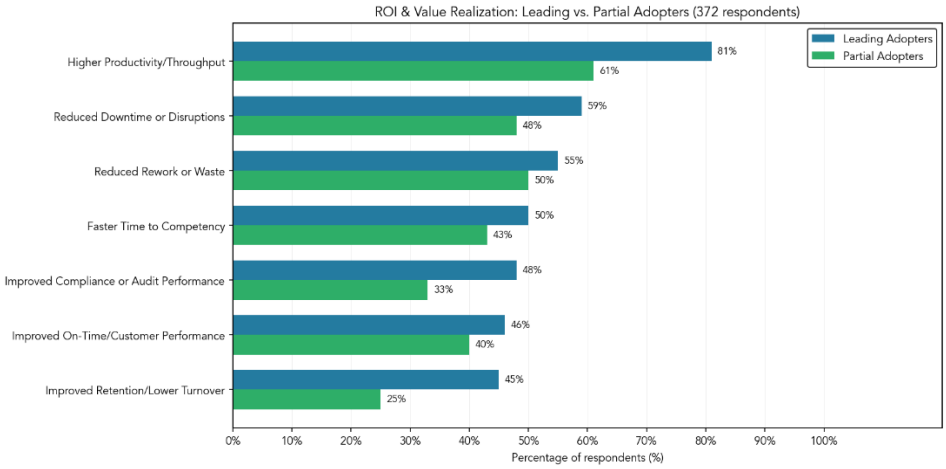
Overall, nearly one in five Partial Adopters (18.9 percent) have no digital system for skills tracking, task tracking, or compliance verification. These organizations have no digital visibility into who is qualified, what was assigned, or whether it was done correctly. The operational cost of this informality is reflected in how organizations sustain change. Among Partial Adopters, 79.1 percent report that sustaining frontline change requires extra effort sometimes, often, or almost always, compared to 67.8 percent of Leading Adopters. Without a consistent system of

record, organizations struggle to scale operations, enforce standards, and maintain continuity as teams grow or change. For organizations without digital frontline infrastructure, this lack of visibility means there is no reliable way to track qualifications, manage work, or verify execution. In these environments, process formalization is not in place at scale, limiting the organization's ability to enforce standards or sustain operational improvements.

Leading organizations are 20 percentage points more likely to improve productivity, translating execution maturity into stronger labor efficiency and throughput.

ROI and value realization

ROI and value realization reflect the measurable operational and financial outcomes achieved through frontline digitization.



The operational differences between Leading and Partial Adopters ultimately manifest in measurable business outcomes. Leading Adopters report higher improvement rates across all major operational metrics. The most significant gains are in productivity, where 81 percent of Leading Adopters report improvement, compared with 61 percent of Partial Adopters. This is accompanied by reductions in downtime (59 percent vs. 48 percent) and rework or waste (55 percent vs. 50 percent), indicating that improvements are not isolated to a single area but extend across the full execution lifecycle. Analysts interviewed a packaging manufacturer that reported reductions in equipment downtime and scrap rates as workers gained the ability to troubleshoot issues independently using embedded guidance.

Leading Adopters are 1.5 times more likely to realize compliance and audit gains, highlighting the value of structured frontline controls.

This gap is particularly pronounced in workforce-related outcomes. Leading Adopters are nearly twice as likely to report improved retention (45 percent vs. 25 percent) and 1.5 times more likely to realize compliance and audit gains (48 percent vs. 33 percent). The productivity gap remains the most significant, with a 20 percentage-point difference

in the most commonly realized benefit. Improvements in on-time performance (46 percent vs. 40 percent) further highlight the downstream impact on customer-facing outcomes.

Frontline execution is becoming a strategic operating lever, as manufacturers and distributors seek greater resilience, scalability, and control in volatile conditions.

These gains are directly tied to the higher levels of execution consistency established by Leading Adopters. As shown earlier, Partial Adopters are significantly more likely to operate in environments with variability across shifts, teams, and locations, where execution depends more heavily on individuals than on standardized systems. That variability translates into measurable performance impact. Among Partial Adopters, 66 percent report that inconsistent frontline execution has a moderate or significant effect on operational performance. Rather than isolated issues, inconsistency becomes a recurring condition that affects throughput, quality, and efficiency across shifts and teams.

Leading Adopters, by contrast, reduce this variability through structured training, digital task management, and system-driven compliance verification. The result is not only more consistent execution, but the ability to convert that consistency into sustained operational gains. Nucleus observed that a healthcare distributor identified a direct correlation between training engagement and maintenance performance, with teams that more actively used digital training resources achieving faster mean time to repair. Overall, Nucleus found that Leading Adopters report realizing roughly one additional operational improvement on average compared to Partial Adopters, indicating a broader and more consistent impact across the operation.

Looking ahead

Operational maturity is translating into measurable gains in productivity, retention, and service.

The findings of this report point to a clear shift in how manufacturers and distributors approach frontline execution. Organizations that have modernized frontline execution through integrated training, task management, and compliance workflows are already operating with greater consistency and control, enabling them to scale more effectively amid labor shortages, geopolitical disruption, and rising customer expectations. As these pressures continue, frontline execution is becoming a central lever for maintaining operational performance rather than a secondary consideration.

This shift is reinforced by direct feedback from operations leaders, many of whom lack consistent visibility into frontline execution and workforce readiness. Across survey responses, organizations highlighted challenges in verifying workforce capability, standardizing training, and ensuring that employees can consistently execute tasks safely and in

accordance with defined procedures. As one respondent noted, "Right now we assume competence," underscoring the lack of visibility into whether workers are fully qualified to perform assigned tasks.

Connected worker systems deliver greater value when integrated with ERP, manufacturing, and supply chain platforms that provide contextual data at the point of work.

Nucleus found that successful frontline digitization efforts consistently begin with a focused scope rather than attempting enterprise-wide standardization from the outset. Establishing a single source of truth for operational knowledge, skills, compliance, and training content is critical to avoid fragmented communication and ensure consistent execution. Early alignment on document structures, naming conventions, and workflow design improves long-term usability and adoption, particularly as content libraries expand. Organizations are also seeing stronger outcomes when frontline workers are engaged early in the process and when solutions are designed with ease of use in mind, supported by active leadership reinforcement of standardized practices. In addition, treating training as an ongoing, structured process rather than a one-time event enables organizations to continuously improve workforce readiness, maintain compliance, and refine operations based on real-time performance feedback.

Across the market, organizations are prioritizing investments that address long-standing gaps in frontline execution. Open-ended responses indicate a strong focus on standardizing safety procedures, formalizing maintenance workflows, and improving onboarding and skills certification processes. Many respondents highlighted persistent variability in how work is performed across shifts, teams, and locations, reinforcing that standard procedures alone are insufficient without systems that drive adoption, accountability, and execution discipline. These challenges are driving organizations to digitize work instructions, replace paper-based processes, and modernize core systems such as ERP and operational platforms to improve visibility, coordination, and accountability.

Artificial intelligence (AI) is beginning to layer into these efforts, with early applications emerging across quality inspection, workflow optimization, data capture, and workforce training. However, its effectiveness is closely tied to the maturity of underlying processes. Organizations without standardized workflows, accessible data, and system-driven execution will struggle to scale these capabilities beyond isolated use cases. In contrast, those with a structured execution model are better positioned to extend AI across frontline operations and drive incremental gains in efficiency and decision-making.

As organizations evaluate connected worker solutions, there is also a growing recognition that these capabilities must be considered within the broader technology ecosystem. Frontline execution does not operate in isolation, and the value of training, task management, and compliance systems increases significantly when they are integrated with core platforms such as ERP, manufacturing execution, and supply chain systems. Organizations that align frontline execution data with broader operational workflows are better positioned to provide workers with contextual, role-specific information at the point of work while improving visibility across planning and execution layers. This alignment is becoming increasingly important as organizations look to scale AI use, which depends on consistent processes and connected data to generate meaningful insights and recommendations.

As one respondent noted, "Right now we assume competence," reflecting a growing priority for organizations to gain clearer visibility into workforce readiness, qualifications, and safe task execution.

Looking forward, the ability to capture value from these investments will depend on how well organizations connect training, execution, and compliance into a unified system. Technology adoption alone is not sufficient without the process discipline required to sustain it. Organizations that operationalize frontline execution as a strategic capability will be better positioned to scale labor, absorb disruption, deploy AI effectively, and sustain margin performance over time.

Survey methodology

Nucleus conducted a survey of 400 operations, IT, supply chain, and training leaders across manufacturing and distribution organizations in North America to evaluate how frontline work is delivered, managed, and digitally enabled. The respondent base included process manufacturing (56 percent), distribution (28 percent), and discrete manufacturing (16 percent). It spanned a mix of organization sizes, including mid-sized (100 to 999 employees), large (1,000 to 9,999 employees), and enterprise organizations (10,000 or more employees), as well as a smaller segment of organizations with fewer than 100 employees. Respondents were primarily from operational roles (70 percent), supplemented by IT and digital leaders (14 percent), supply chain professionals (11 percent), and training or continuous improvement functions. The study was geographically concentrated in the United States (82 percent) with additional representation from Canada (18 percent). Organizations were segmented based on adoption of five core digital frontline practices: work instruction delivery, training, real-time guidance access, skills and certification tracking, and task completion with compliance verification. Those with four or more practices were classified as Leading Adopters, those with one to three as Partial Adopters, and those with none as Non-Adopters.