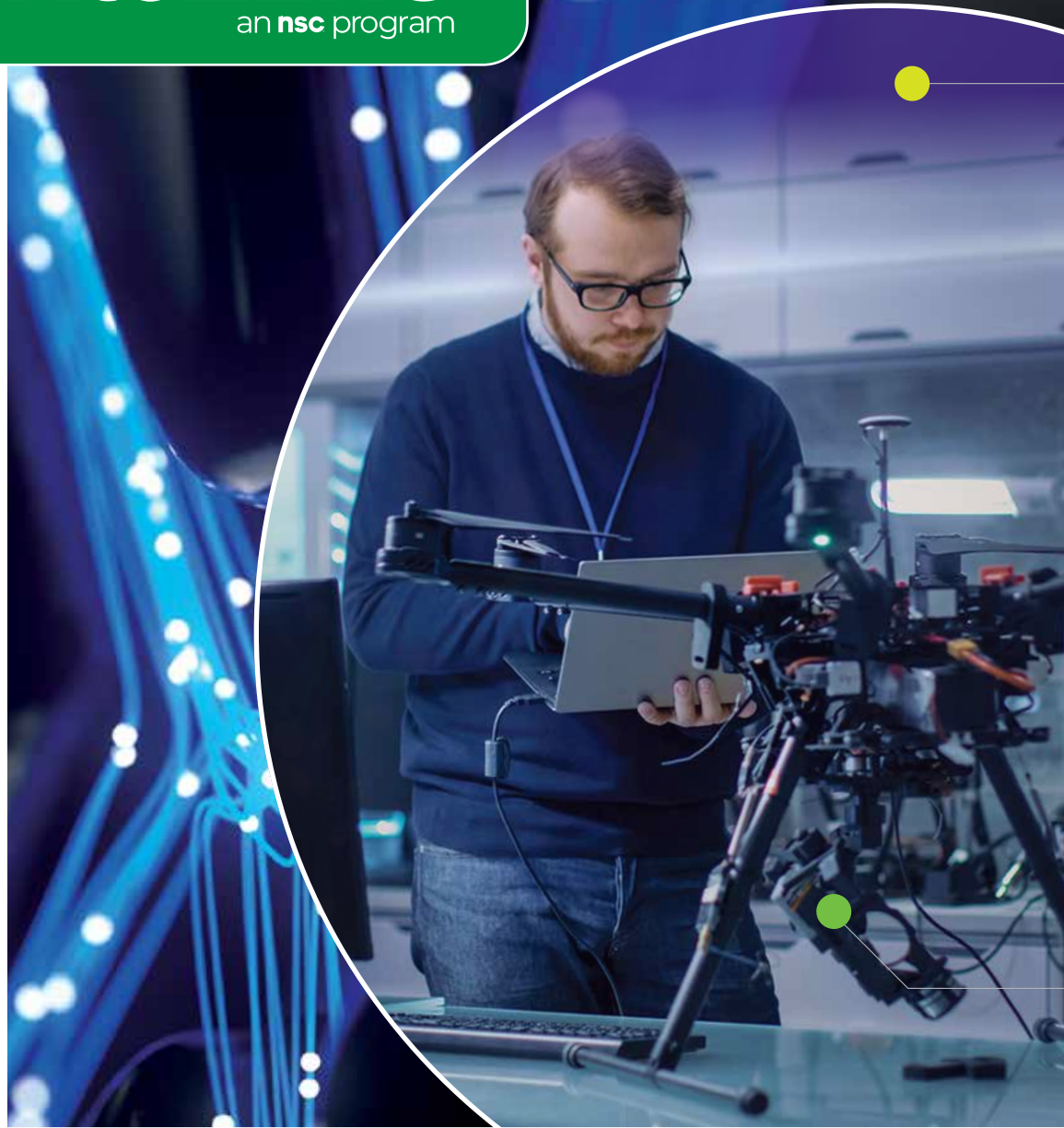


WORKtoZERO
an nsc program



**Determining Readiness
for Safety Innovation
and Industry 4.0**

nsc
National Safety Council

Digital technologies are driving operations into the Industry 4.0 era and present a unique turning point for safety. Digital technologies include any electronic tools, systems or devices that generate, store or process data. From enhancing visibility regarding risks, to enabling personalized intervention, to offering new ways to alert, inform, engage and influence our workforce, digital technologies are transforming how we protect our workers, minimize loss and increase profitability. Yet, to yield the true potential of what digital transformation has to offer, organizations must be very intentional in their investments to equip and align their mindsets, skillsets and toolsets.





Barriers to Implementing Safety Technology

Evidence shows organizations have experienced great difficulty in implementing digital change and safety technology. According to a global survey of over 1,000 senior executives in 2019, one of the top 10 obstacles to innovation was, "...existing operations, legacy IT infrastructure, and insufficient embrace of digital thinking and capabilities may not meet performance expectations" (Executive Perspectives, 2019). Another survey of CEOs estimated 70% of digital change projects don't manage to achieve their goals, and of the \$1.3 trillion spent on digital transformation in 2018, \$900 billion went to waste (Tabrizi, Lam, Girard, & Irvin, 2019). In addition, a 2017 study of technology integration initiatives found 50-75% of implementations failed in terms of quality, flexibility and reliability as a result of inattention to human-related issues (Charalambous, Fletcher, & Webb, 2017).

Other individual and organization-level barriers hindering implementation include reluctance to change, concern about errors and concern about loss of productivity during the initial implementation phases (Rizer, Kaufman, Sieck, Hefner, & McAlearney, 2015). Further, a lack of employee involvement in the implementation process and the resulting lack of awareness and support among personnel were noted as barriers. These barriers can be found in safety technology case studies from around the world. For example, a case study of a digital transformation effort in South Korea also concluded, "manufacturing firms largely fail to achieve successful implementation and grasp its full benefits due to lack of understanding of the human and social-related issues" (Hur, Cho, Lee, & Bickerton, 2019).

In a 2020 Work to Zero study of 500 employers and 1,000 employees from mature safety companies, it was found the most common barriers to implementing digital change included: adaptability of technology to specific organizational needs, limited number of use cases and examples of successes with technology, resistant workforces and limited knowledge of what technology is available (Washburn, 2020).

Readiness and the Importance of the Human Mindset

"Readiness" is the state of being fully prepared for something: fit, primed and standing by. It means being prepared to accept and adopt something with an eager willingness, enthusiasm and awareness of the importance of innovation. It also means understanding the needed adjustments and learning that come with the change. This description accounts for the human element in the process of innovating safety in Industry 4.0. It is both people's willingness and ability to use, maintain and apply the technology determining whether or not it is successful.

To harness this human potential, it is important leaders inspire trust by engaging employees in co-defining the purposes and need for change and new technology. This can help people see innovation as an opportunity rather than a threat, thus fostering readiness for digitalization. When people feel valued by their leaders, trust grows. Leadership must replace employee anxiety toward change and fears around job security with curiosity and a sense of purpose so people can genuinely take part in the organization's digital journey.

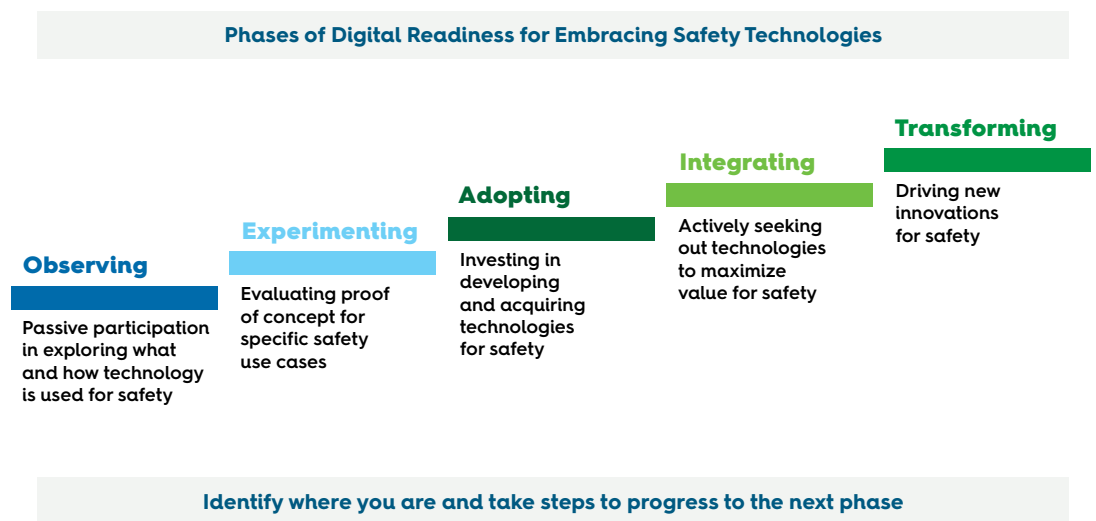
The adoption of technology for business operations affects a number of groups, from the decision to invest, to the purchasing process, eventual implementation and ongoing use by end-users. If the reasons behind the decision to adopt a specific technology are not understood or valued by the eventual users, trouble could result. For business operations, therefore, it is critical to:

- **Align** with the business value and articulate 'why' the new technology is needed (Appelbaum, Habashy, Malo, & Shafiq, 2012)
- **Assess** how the technology interacts with and impacts the various users and groups throughout its life-cycle
- **Identify** what supporting elements are needed (e.g., IT infrastructure, talents, functions, activities, resources, process changes, etc.)
- **Clarify** expectations, anticipate errors and assess the possible unintended consequences

More and more technology vendors now focus on human-centered design and innovation to better equip companies for innovation and digital readiness (Slansky, 2020a; 2020b). Technology fulfilling necessary functions should not create additional challenges and burdens to humans.

Phases of Readiness

In considering safety innovation for Industry 4.0, a five-phase model can be used to help determine progress in organizational readiness.



► **In the earliest phase, Observing**, the organization is unsure about the value of innovating and is passively exploring how digital technologies can be used for safety. A lack of digital skillsets exist across the organization and an overall lack of trust may be present among leaders. The following points are relevant to move to the next phase of digital readiness:

- **Collect feedback** from decision-makers, employees and other affected groups to determine the available resources needed for innovation
- **Gather evidence-based information** about possible digital solutions relevant to the business, top hazards and the needs of the workforce

► **In the Experimenting phase**, proof of concept activities may be taking place, usually in conjunction with a specific project related to digital application. Most people in the organization can be considered technology bystanders and the speed of innovation relies heavily on the individual project outcomes. To move beyond this experimenting phase, the following are important steps to consider:

- **Identify digital champions** who can assist with planning and other elements of change management
- **Establish a roadmap** adequately assessing the company's mindset, skillsets and toolsets necessary for innovation

► **In the Adopting phase**, investments are being made in developing and acquiring the skillsets and relevant technologies. A well-defined purpose for technology and safety is communicated and most people in the organization accept and support the use of safety technologies for innovation and benefit. In this phase, the organization applies change management principles to nurture and maintain the positive mindsets of the affected groups. Best practices leading to a more mature digital readiness status involves:

- **Ensuring digital safety activities** are operating as intended and are integrated seamlessly in all affected organizational processes
- **Continuing to collect feedback** from decision-makers, end-users and other affected groups to support learning and modify practices or processes, as needed

► **In the Integrating phase**, an alignment of digital mindsets, skillsets and toolsets exist and most in the organization are actively involved in digital safety activities. There is clear appreciation of the benefits safety technology can provide, both to the organization and the individual. Change management principles are used to manage any new vulnerabilities or risks, and the organization actively seeks out technologies and talents to maximize the value for safety. Key points of interest related to organizational maturity and digital readiness include:

- **Evaluating the integrity of data and digital outputs** to ensure alignment with current and/or future organizational values regarding safety and business goals
- **Considering the opportunity to incorporate digital solutions and innovation** in all aspects of organizational capabilities and vision

► **Finally, in the Transforming phase**, mature organizations incorporate a digital vision set to establish future safety strategies and drive new safety innovation. The digital value for safety and business is constantly and intentionally leveraged to manage the company's risk profile and to expand the scale and scope of worker engagement and protection. Once in a transforming phase, it is important for companies to:

- **Employ continuous improvement principles** to ensure alignment among the company's digital mindsets, skillsets and toolsets
- **Nurture the digital vision and integration** across the company by committing the necessary resources for maintenance and growth in innovation



Readiness to Pilot Technology

Lofty expectations can exist around the speed and degree of benefits of safety technology. Processes may be overhauled and new competencies built, but implementation and organization acceptance takes time. Leaders must be vigilant to support the adaptation of the new processes and prevent old habits from finding new ground.

Launching a pilot project is an excellent way to learn, make corrections on a small scale and reduce investment risk. In this case, a small group of independent, capable and flexible team members organized to examine a technology and respond to elements such as usability, integration and scalability is ideal. Digital champions can be identified from this team to act as communicators for a broader technology implementation.

Prior to piloting a technology, it is critical to prepare affected groups for technology and support readiness. This includes assessing their acceptance and willingness to use the technology, their skill and problem-solving ability, and their cultural appetite for change (Lin, Shih, & Sher, 2007). A thorough assessment will present opportunities for leaders to provide support and ensure individuals have a sense of shared responsibilities and collective purpose. Such an assessment could inform the organization as to where and how to start.

Conclusion

Simply implementing technology does not constitute successful safety innovation for Industry 4.0. Through a focus on determining organizational readiness and preparing people for change, companies develop agility and resiliency in their efforts to save lives at work through the use of digital technologies.

To identify your organization's digital readiness level when it comes to safety technology, use our free ***Organizational Readiness Assessment for Safety Technology in the Workplace*** available at nsc.org/DigitalReadiness.



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