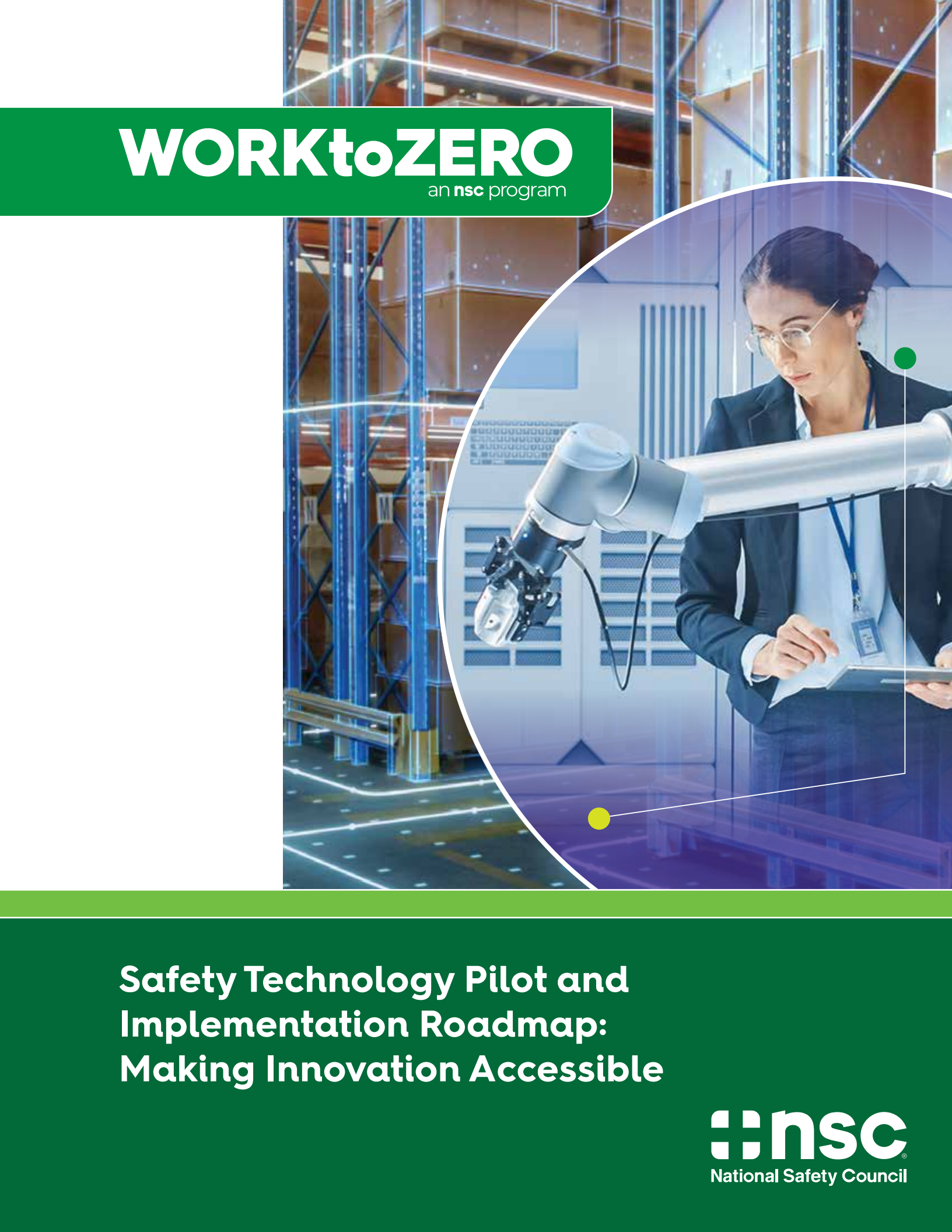




WORKtoZERO
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Safety Technology Pilot and Implementation Roadmap: Making Innovation Accessible

Digital transformation is here to stay

Businesses are currently using technology for a variety of purposes, from staying competitive in the marketplace, enhancing operational processes and outcomes, to protecting workers and saving lives on the job. According to Farris (2020), “digital transformation involves digital technology adoption,” and represents, “a paradigm shift that allows companies to actively disrupt the status quo and test uncertainty.” The evolution of digital transformation began more than 30 years ago as computerized procedures were leveraged for business purposes. Today, we rely heavily on digital technologies for both personal and professional functions. From smartphones and mobile applications to the use of camera analytics for security purposes, the possibilities of digital technologies are endless.

In the current Industry 4.0 landscape, technology adoption is gaining additional traction and the use of existing and emerging technologies is showing great promise. The concept of “Industry 4.0” refers to a fourth industrial revolution focused on the broad networking capabilities and the internet of things (IoT). This new industry landscape follows technological advancements of the steam engine, the assembly line and use of electrical energy, and the early uses of computers for automation. Today, Industry 4.0 emphasizes advances in communication and connectivity, which can be considered functions of a variety of technologies including robotics, artificial intelligence, biotechnology and more (Schwab, 2018).

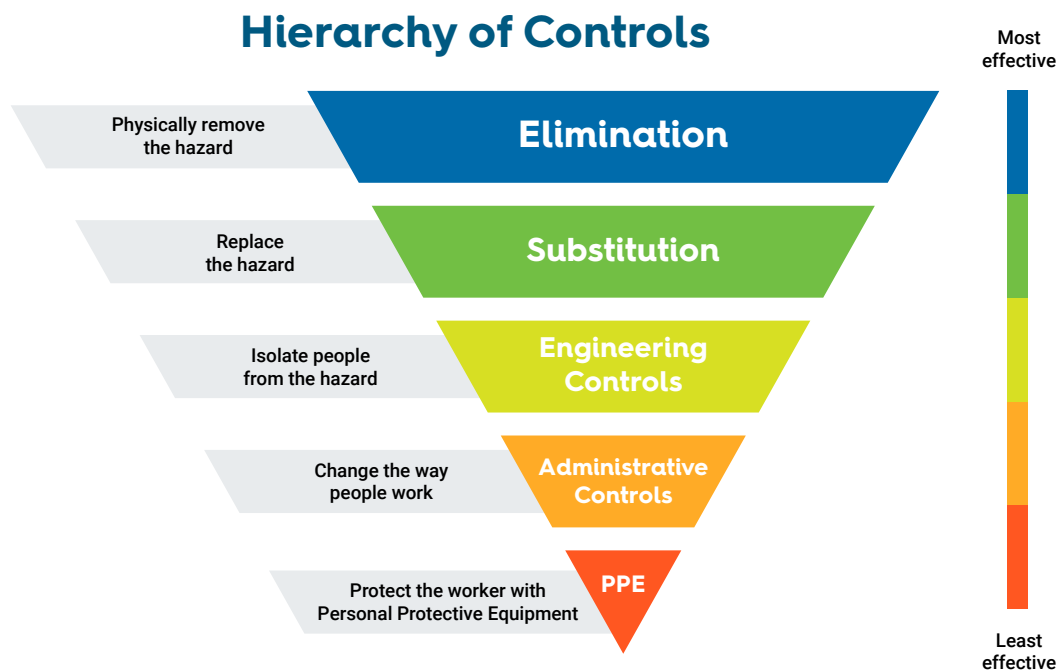
Digital technologies are developing, and innovation is moving rapidly. New uses for technology are being realized every day, including for enhanced safety and fatality prevention in the workplace. To remain competitive and relevant, businesses are embracing digital transformation, sometimes before they are ready. In this paper, the challenges to innovation will be discussed, and a roadmap for piloting and implementing technologies is presented.



Making innovation accessible

To prepare for piloting or implementing safety technology several steps exist to assist employers on their innovation journey. Unfortunately, many small to medium-sized companies lack the resources or learning agility needed to successfully innovate. The Work to Zero initiative at the National Safety Council is committed to making innovation more accessible, particularly for small to medium-sized companies and those from safety-sensitive industries, such as construction, utilities, manufacturing, mining, and oil and gas. Through the development of research-based tools, educational resources and strategic partnerships, Work to Zero has already witnessed success toward its mission to eliminate non-roadway workplace fatalities by 2050.

It is important to address the controversy surrounding around a “zero” mission. To clarify, Work to Zero is focused on raising awareness and assisting employers in the adoption of technology solutions to eliminate hazardous situations contributing to workplace fatalities. According to the National Institute for Occupational Safety and Health (NIOSH) (2015), “Controlling exposures to occupational hazards is the fundamental method of protecting workers.” Through the adoption of safety technology, employers can move beyond personal protective equipment and administrative controls and focus on the benefits of isolating workers from hazardous situations and exposing them to minimal, or zero, risks that could lead to a fatality.



“Safety technology can help isolate workers from hazardous situations and eliminate their exposure to risks.”

Barriers to innovation in the workplace

Innovation can be defined as “something different that creates value” (Anthony, Cobban, Nair, and Painchaud, 2019). As broad as this definition is, innovation is most often tied to the application of technology to automate or streamline work processes and practices. However, Anthony et al. (2019) cited a McKinsey survey that found, “94% of executives are dissatisfied with their firms’ innovation performance,” and suggested a fundamental barrier to the success of innovation is, “day-to-day routines and rituals that stifle innovation.” Similarly, Kirsner (2018) studied the biggest obstacles to innovation in large companies and found, “politics, turf wars, and a lack of alignment; cultural issues; inability to act on signals crucial to the future of the business; lack of budget; and lack of the right strategy or vision,” were to blame.

Many of these barriers are human-centered. In fact, survey research conducted by the National Safety Council found the most perceived barriers for adopting and implementing safety technologies included:

- **Adaptability of technology to specific organizational needs**
- **Limited number of use cases and examples of successes with technology**
- **Resistant workforce**
- **Limited knowledge of what technology is available (Washburn, 2020)**

As it turns out, digital transformation is not only about technology. What truly leads to success and gives companies a competitive edge relates to the human side of the organization. But as we have seen in many digitalization discussions, people are often missing from the equation.

Learning agility is key to successful innovation

In order for humans to interact effectively with their organization’s chosen technology, they need to cultivate an attitude of curiosity and develop the mental agility necessary to respond to benefits from rapid technological advancements. Mindful organizations, therefore, invest in developing learning agility among both leaders and the workforce. People who are high in learning agility are sensitive to the unexpected, thrive on uncertainty, embrace change, and seek out and apply learning from unfamiliar experiences. Research has shown complexity, unpredictability and ambiguity are key drivers to developing adaptive behavior. Leaders who thrive in constantly changing environments demonstrate higher levels of independence, initiative, innovation and confidence (De Meuse, Dai, & Hallenbeck, 2010).

De Meuse et al. (2010) explained agile leaders and learners must be supported by agile institutions. This speaks directly to the fact that the best learning environments go beyond the classroom – physical or virtual – to include the entire ecosystem, from workspace design to leadership support for innovation and building a learning culture. To encourage learning and exploration and adaptation of new technologies, organizations should provide a safe space to experiment and enough time to scale. As such, when thinking about the value of implementing safety technology, learning agility is key.

The investment and effort required to build a learning-minded culture and ecosystem will pay dividends down the road, not only for adopting new technologies, but minimizing drama and confusion when the inevitable glitches occur. A curious, learning-oriented workforce will be quick to see the context around the glitches. They are slow to blame, more resilient and patient when technology may, at first, be slow to deliver on its promises.

Gearing up to innovate

To prepare for piloting or implementing safety technology, several steps exist to assist employers on their innovation journey. Simply implementing technology does not constitute a successful digital transformation. By focusing on preparing people for change and properly assessing digital readiness, organizations invest in developing agility and resiliency that can produce endless benefits.

Oftentimes, a company will skip right to rolling out a technology, which disregards any work invested to prepare people, refine the culture and adopt a strategy for the proposed technology. While it is unlikely any technology rollout will be perfectly smooth, the gap between the existing support systems and modern technology can be challenging to bridge. The complexity and variability of the change processes and resource allocations may further complicate matters. There can be lofty expectations about the speed and degree of the technology's benefits. Processes may be overhauled and new competencies built, but habituation and fluency take time. The design team needs to define activities and expectations to reinforce and adjust. Managers must be vigilant to support the adaptation of the new processes and prevent old habits from finding new ground.

Prior to roll-out, it is critical to prepare affected groups for technology and to 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). Assessing who will be most affected by the technology implementation will present opportunities for leaders to provide support and ensure individuals have a sense of shared responsibilities and collective purpose.

Launching a pilot project is an excellent way to learn, make corrections on a small scale and reduce investment risk. In this case, gathering a small group of independent, capable and flexible team members to incubate technology and work out kinks in usability, integration and scalability is ideal. These individuals can be considered digital champions, or individuals who are curious and enthusiastic to learn about the benefits technology can offer, and they can be selected from this team to act as communicators for the broader roll-out. These early efforts are key to assure alignment of a company's "mindset, skillset and toolset."

Mindset refers to a human-centered vision toward innovation

– Represented by leaders committed to people first and interested in how technology can be used to protect the organization's greatest resource – people

Skillset includes the key competencies or knowledge needed for digital transformation

– Examples include IT skills, the ability to select relevant technologies, etc.

Toolset includes key structural requirements for innovation

– Examples include capable and compatible networking structure, data capture, storage and processing ability, etc.



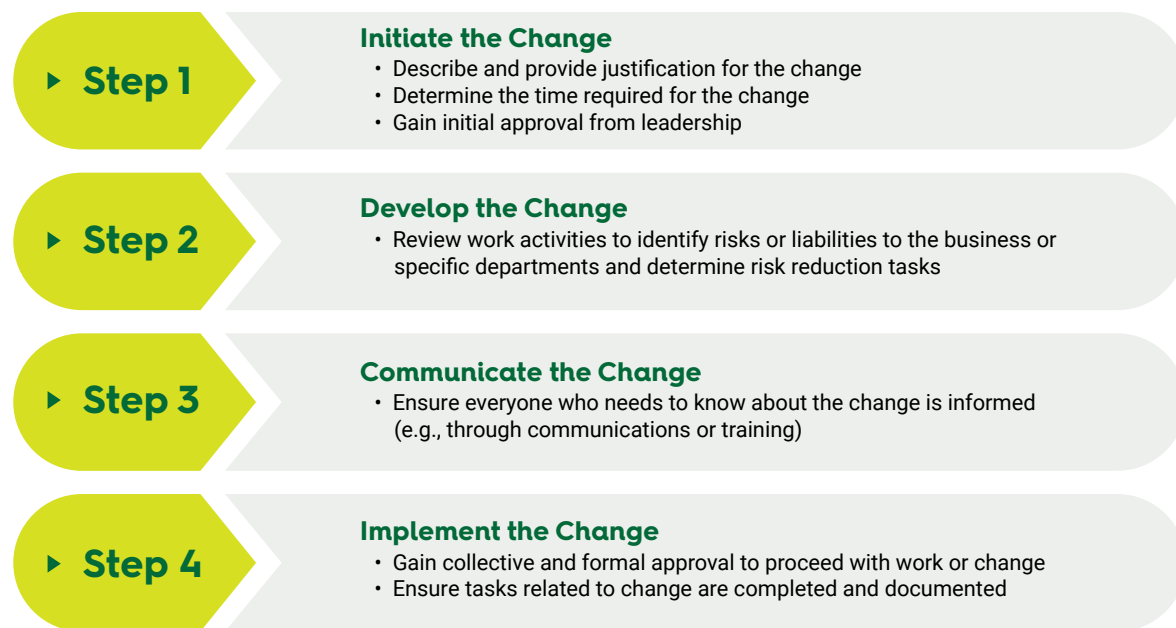
Managing change in organizations

Any attempt to pilot or implement technology in an organization requires attention to a management of change (MoC) process. According to Stobierski (2020), “virtually every organization will, at some point, undergo a transition or change in order to remain viable and scale,” and some of the most common sources of change include:

- New leadership at the helm of the company or within its departments
- Shifts in the organizational team structure
- The implementation of new technology
- The adoption of new business models

Formal MoC tools exist to assist companies navigating changes, small and large. A change management process provides a standardized way to manage change considering the effects of a change on safety, environmental, health, reliability and production efficiency. It is designed to ensure all change activities (operational, organizational and business processes) are reviewed, approved, communicated and documented to eliminate or reduce the likelihood of unintended negative effects or burdens.

Four steps involved in a general MoC process include:



“A lack of effective change management can easily lead to the failure of technology adoption.”

Stobierski (2020) explained, “organizational change is necessary for companies to succeed and grow,” and, “it allows employees to understand and commit to the shift and work effectively during it.” If companies fail to manage change related to the implementation of new technology, employee morale is likely to suffer, and employees will be denied the ability to develop skills and competencies needed in Industry 4.0. Ultimately, a lack of effective change management can easily lead to the failure of technology adoption. As Stobierski (2020) reminded, “Change management doesn’t stop once you’ve successfully executed the transition. Both throughout and following the process, you need to continuously assess outcomes, measure data, train employees on new methodologies and business practices, and readjust goals as necessary.”

Pilot and implementation roadmap

To assist employers on their journey to save lives using technology, the following pilot and implementation roadmap is a framework for guidance. It is important to note that depending on a company's digital readiness, they may utilize the roadmap at a different starting point. Further, based on the outcomes experienced working through the steps, it may be required to revisit prior steps. Piloting and implementing safety technology is not a linear process. In fact, effective efforts toward continuous improvement require accepting an open and learning-centered process.

The following four-stage roadmap (see page 10) includes actions for employers to follow in their work to drive digital transformation and save lives:

Stage 1: PLAN

In this initial stage, it is important to determine the business goals for digital transformation. The backbone of digital transformation is well-articulated values. Business managers often desire modern technology for its ability to provide extraordinary growth, allow for more visibility and control, deliver challenging and time-consuming work with ease, and the list goes on. Yet, unlike the adoption of personal digital devices, where the decision-maker, buyer and user are the same person, adoption of technology for business operations affects completely different groups, from the decision to buy, purchasing process, eventual implementation and ongoing use. If the reasons behind the decision to adopt a specific technology are not understood or valued by the eventual users, trouble could ensue.

In applying management of change (MoC) principles to assess the business impact, it is important to:

- **Align on the business value and articulate the collective 'why' the new technology is needed (Appelbaum, Habashy, Malo, & Shafiq, 2012)**
- **Step back to assess how the technology interacts with and impacts the various users and stakeholders throughout its lifecycle**
- **Identify what supporting elements – IT infrastructure, talents, functions, activities, resources, process changes – need to be put in place to fully leverage and realize its value**
- **Clarify expectations, anticipate errors and assess the possible unintended consequences**

The next step in this initial stage is to assess the company's organizational and digital readiness level. Through discussions among the initial individuals involved in framing the company's attempt to innovate, consensus about the business goals and strategic vision for digital transformation can be realized.

Stage 2: PREPARE

One of the most important steps in the preparation stage to pilot or implement safety technology involves engaging a group of digital champions representing all levels of the organization. Often it is a challenge for organizations to identify the needed skillsets, to find the right fit and quickly determine what upskill is needed. Once again, more and more discussions focus on learning agility as a critical talent attribute for the digital era. When a company embarks on digital change, a coalition approach can enable open lines of communication through champions who already belong to the business. **The following questions can serve as guideposts for coalition formation and discussion:**

- **What use cases and purposes may the technology serve and under what conditions?**
- **How will our needs evolve? How will the technology evolve?**
- **Who interacts with the technology and in what ways?**
- **Who is affected by this technology?**
- **What may need immediate attention and problem-solving?**

- What upskilling potential will connect with employees?
- What are some hidden safety and security risks and possible unintended biases?
- What skills and expertise are needed to discern and anticipate those hidden and unintended risks and biases?

Revisiting organizational readiness and gathering additional perceptions about the company's capabilities to innovate can provide value to ensure a focus on the human mindset is considered for how the innovation will affect individuals and specific business units.

In this stage, it is also important to determine the anticipated data structure and reporting alignment.

Fundamental questions to support this activity include:

- What data are needed to fulfill the purpose of technology implementation to meet the identified business goals?
- How is that data captured?
- Who contributes to that data?
- How is the data processed and what will the output be used for?

This step in the preparation stage relies on engaging the right individuals to help champion the efforts toward digital transformation. Often, this requires involving personnel with key toolsets, such as IT professionals who better understand data capture and processing. The involvement of a broad coalition creates a shared sense of responsibility and helps the technology pull the organization along instead of pushing into its fabric.

Finally, revisiting management of change (MoC) principles here can provide a level of assurance the innovation will help to achieve the business goals and strategic direction and not disrupt or lead to negative consequences across organizational levels.

Stage 3: EVALUATE

In the evaluation stage, possible technology solutions are designed or selected. The speed at which technology solutions are developed or enhanced can seem overwhelming. The pace of technological advancement causes many business leaders to worry about being left behind or to act too quickly to invest. It is easy to become distracted by shiny objects when technology sounds so promising. Therefore, it is critical to examine what precisely the organization wants to achieve and how best to achieve it. Some of the questions listed above provide a good starting point for these discussions.

Evaluating evidence of a technology's proof of concept is important to ensure relevance and potential success of the technology being considered. Case studies or use cases from like businesses can serve as useful points of comparison and analysis to make a technology solution fit-for-purpose. One caveat is to remember functionalities are only one aspect of the whole. **A carefully identified set of comprehensive criteria should be considered, such as scalability, ease-of-use, data quality and transferability, minimal business interruption, security, compatibility, maturity of the technology, etc.**

Finally, in examining the return on investment (ROI) of a technology, the costs and value involved in operating business-as-usual compared to innovating can be realized. After a thorough discussion, a technology solution can be assessed for its suitability to meet the strategic business goals, the estimated costs and benefits, and the potential for added value.

Stage 4: INNOVATE

Prior to roll-out, it is critical to revisit and engage 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 et al., 2007). Continually assessing the impact of the change on individuals will present opportunities for leaders to provide support and ensure a sense of shared responsibility and collective purpose.

Launching a pilot project is an excellent way to learn, make corrections on a small scale and reduce investment risk. In this case, again gathering a small group of independent, capable and flexible team members to incubate a technology and work out kinks in usability, integration and scalability is ideal. Digital champions can be selected from this team to act as communicators for the broader roll-out.

In this stage of innovation, it is important to evaluate data integrity and performance toward digital objectives and business goals. As a reminder, this overall pilot and implementation roadmap is based on a continuous improvement framework. Following MoC principles and conducting regular assessments regarding the use of the technology and the data produced is key to the success of the innovation. Committing to continuous improvement and monitoring allows companies to realize a greater sense of business learning and agility across all aspects of the organization.



Conclusion

Digital transformation is here to stay. Employers can embrace innovation and lead their businesses in competitive and relevant ways for a wide range of value. Investing in digital technologies can offer returns on a company's bottom line, improve operational efficiencies, enhance culture and most importantly save lives. By remaining human-focused and navigating barriers to innovation, employers can effectively manage organizational change and enhance the learning agility of their organization.

Successful digital transformation happens when humans are ready, willing and capable of fully applying the right technology and benefiting from it. By following MoC principles and committing to a continuous improvement framework to guide the pilot and implementation process, businesses can succeed in their journey of innovation and save lives at work.

Safety Technology Pilot and Implementation Roadmap

It is key to note this is not a linear journey and you may need to revisit the roadmap several times throughout the process.

1. Plan

- Define values and business goals
- Consider management of change (MoC) to assess business impact
- Ensure organizational readiness

2. Prepare

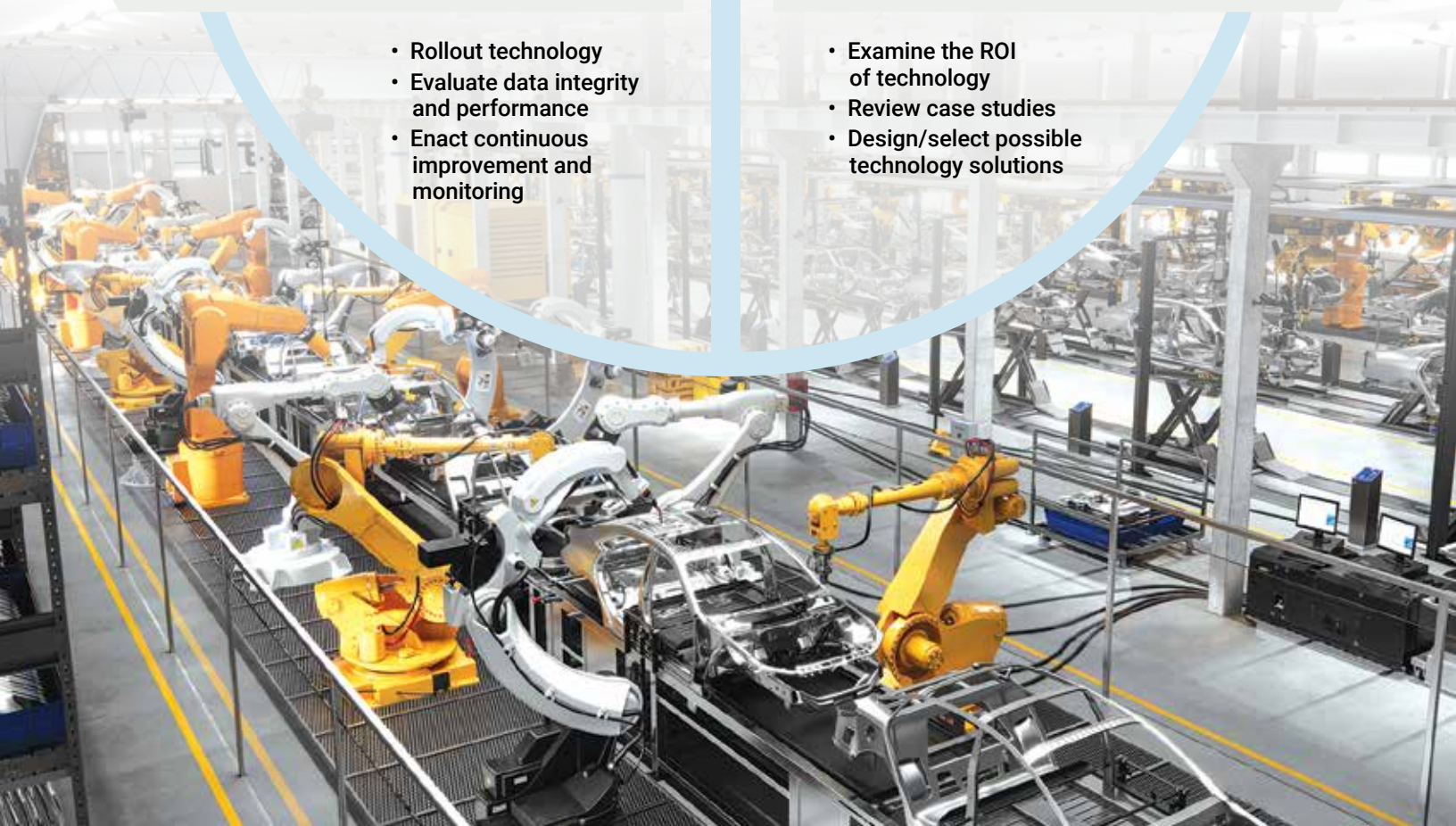
- Build a coalition of digital champions representing all employment levels and revisit readiness
- Determine data structure and reporting alignment
- Revisit MoC

4. Innovate

- Rollout technology
- Evaluate data integrity and performance
- Enact continuous improvement and monitoring

3. Evaluate

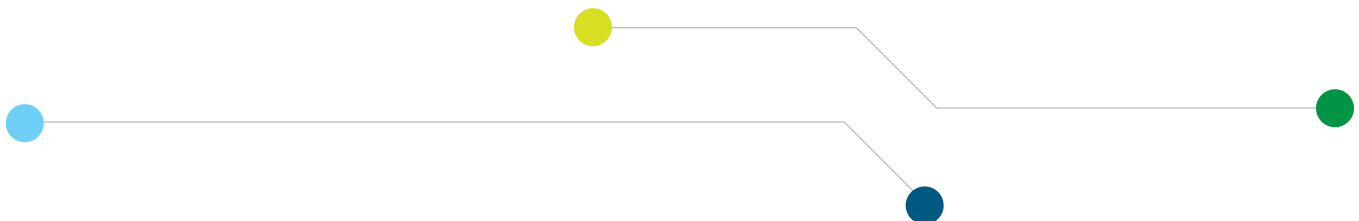
- Examine the ROI of technology
- Review case studies
- Design/select possible technology solutions



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