PEOPLE + AI = THE NEW INDUSTRIAL SUCCESS FORMULA

TECHNOLOGY VISION 2017 FOR INDUSTRIAL EQUIPMENT
The pace of technology advances is transforming how industrial companies sell and manufacture their products. It’s also having a profound impact on customers and the workforce, creating a “new normal” for collaboration—between people, machines, and organizations—enabled by intelligent algorithms, ecosystems, infinite and costless computing power and storage.
With customers’ power increasing, companies need to reorient their products, services, internal processes and workforces to deliver desired customer outcomes. Technology still matters, but functionality alone is not enough. To truly advance, businesses need to account for human behavior and become a business partner that will provide positive customer experiences and help their customers and workforces to achieve their personal goals.

With rapid industry change, the definition of a product, and the ways that products are created, is being challenged. Smart and connected products are at the core of this transformation. In Industry X.0, the voice of the customer is part of product conceptualization. Artificial intelligence can compress time to market. However, there’s a critical new dimension: people (customers, partners and employees), who are increasingly in control. Via rapidly proliferating social media channels, customer and employee feedback is received online and immediately shared with investors and competitors. Companies are realizing that by using technology to enable people to achieve their personal goals, they can achieve tremendous business benefit. Accenture, General Electric, and Boeing all independently studied how advanced mixed-reality technology flexibly supports people, and found that when people got to choose how to apply it to their goals, tasks were completed up to 46 percent faster.¹

This thinking aligns with Accenture’s vision for what we call “Industry X.0”. It’s nothing short a complete re-think in how enterprises make products. It flips lifecycles upside-down by opening them up to consumer input and influence. Products will be designed, prototyped, manufactured, assembled, distributed, and operated in ultra-short and automated lifecycles, and the workforce will be highly-collaborative and equipped with artificial intelligence to help accelerate tasks.

The main theme for this year’s Accenture Technology Vision is “Amplifying People”. The role of technology has shifted to become an enabler that helps people to achieve their goals, think differently and create new revenue streams.

But industrial companies face another pivotal development where collaboration and new ways of working outside the four walls of the business are becoming increasingly influential. The rapid spread of Artificial Intelligence and IoT enabled by ecosystem partners are particular drivers.

Bringing together people and technology is exemplified in all five key trends of this year’s Technology Vision: AI is the New UI; Ecosystem Power Plays; Workforce Marketplace; Design for Humans; and The Uncharted. In the following sections, we’ll examine each of these in more detail.

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Artificial intelligence (AI) is about to become a digital spokesperson for companies. Moving beyond a back-end tool for the enterprise, AI is taking on more sophisticated roles within technology interfaces. From autonomous driving vehicles that use computer vision, to live translations made possible by artificial neural networks, AI is making every interface both simple and smart—and setting a high bar for how future interactions will work. It will act as the face of a company’s digital brand and a key differentiator—and become a core competency demanding of C-level investment and strategy.

Companies are increasingly integrating their core business functionalities with third parties and their platforms. But rather than treat them like partnerships of old, forward-thinking leaders leverage these relationships to build their role in new digital ecosystems—instrumental to unlocking their next waves of strategic growth. As they do, they’re designing future value chains that will transform their businesses, products, and even the market itself.

Driven by a surge of on-demand labor platforms and online work management solutions, legacy models and hierarchies are being dissolved and replaced with open talent marketplaces. This resulting on-demand enterprise will be key to the rapid innovation and organizational changes that companies need to transform themselves into truly digital businesses.

We shape technologies so it adapts to us. The new frontier of digital experiences is technology designed specifically for individual human behavior. Business leaders recognize that as technology shrinks the gap between effective human and machine cooperation, accounting for unique human behavior expands not only the quality of experience, but also the effectiveness of technology solutions. This shift is transforming traditional personalized relationships into something much more valuable: partnerships.

Businesses are not just creating new products and services; they’re shaping new digital industries. From technology standards, to ethical norms, to government mandates, in an ecosystem-driven digital economy, one thing is clear: a wide scope of rules still needs to be defined. To fulfill their digital ambitions, companies must take on a leadership role to help shape the new rules of the game. Those who take the lead will find a place at or near the center of their new ecosystem, while those that don’t risk being left behind.
Across all industries, artificial intelligence (AI) is coming of age. It’s being used to address a wide range of challenges, large and small, by making interactions with systems simple and smart. In the process, AI is becoming the new UI, an increasingly intelligent and intuitive interface through which people inside and outside the business can interact with technology.

AI’s applications in industrial equipment businesses embrace both front- and back-office activities. Embedded AI is helping to deliver products and services that are easier and more intuitive for customers to use. Behind the scenes, it enhances manufacturing and production processes with new levels of intelligence, collaboration and insight that are contributing to differentiated outcomes.

Research for the Accenture Technology Vision 2017 shows that over 90 percent of industrial equipment executives expect AI to transform their industry over the next three years. Seventy-eight percent of them expect the change to be complete, or significant. With continuing advancements in AI technology, these changes are already playing out today.
Within businesses, AI is enabling machines to communicate with one another, and with the infrastructure surrounding them. Researchers at Siemens, for example, have developed prototype AI spider-like robots that collaborate to 3-D print structures and surfaces. This will one day accelerate the production of large-scale, complex structures like aircraft fuselages and ships' hulls. Or to take another example, Schneider Electric worked with Accenture Labs researchers to use AI in hyper-compressing the engineering, simulation and testing of electrical breaker boxes.

Within the supply chain, AI is supporting new smart interfaces that are contextually aware and can super-impose virtual imagery on physical objects. This, for example, can help workers to identify the location of parts in a warehouse, or can be used to guide maintenance activities out in the field. Techniques like these are also being used to simulate and test new designs, and identify any flaws, long before they go into production. In Caterpillar’s new Immersive Visualization Center, considered by many to be North America’s largest virtual reality “cave”, engineers can virtually “walk through” an assembly line as it’s being designed.

A common factor underpins the successful implementation of AI, in all its forms: data. The enormous quantity of data created by embedded sensors and smart applications raises some key issues. In terms of customers, it’s important for industrial equipment companies to make sure they have transparent and ethical data policies that reassure customers about the collection and use of their information. The quality and quantity of data is foundational for effective AI. Without it, AI solutions, no matter how sophisticated, will not achieve their potential.

At the moment, we’re seeing some astounding developments taking place in the AI field. But these are still exceptions. Most industrial equipment businesses are taking a tentative approach. As they move forward, they need to bear in mind a few key considerations.

- **Data Security**
  - Understand how data is currently being used. Rewrite policies to align with business strategy and reinforce customer trust.
  - Make data policies transparent to customers via different channels. Explicitly mention how customer data is being used and what customers receive in exchange for providing their data. Enable customers to opt in or out.

- **Ethics of AI/Algorithm Development**
  - Train your AI algorithms before making them public. Learn from past mistakes and have proactive mechanisms to understand when things go wrong.

- **Social and Organizational**
  - Companies must work to gain and keep trust at every interaction—putting the power in the hands of employees is the appropriate way to do it.
  - Develop your workforce of the future strategy: understand the key skills gaps in your organization, areas that likely will be impacted and areas that you need to maintain people versus machines.
  - Define a set of skills necessary to develop AI solution for your organization that will help accelerate technology adoption.
In this new world, data is the new hard currency and the ecosystem becomes a vital conduit for commerce. That’s why companies today need more than a platform strategy. They need a rich and robust ecosystem approach to lead in this new era of intelligence. As software continues its rise, platforms that can engage with hardware-agnostic ecosystems are emerging as industry leaders.
It’s a fact readily acknowledged by companies in this sector. Research for the Accenture Technology Vision 2017 shows that almost 95 percent of executives consider a platform-based business model and ecosystem engagement with digital partners to be critical to their future success.

Some of the disruption driven by these new ecosystems can be predicted. For instance, companies are targeting significant uplift in their own capabilities through these approaches. Schneider Electric, for instance, recently announced the launch of EcoStruxure™. This is a next-generation architecture and platform for delivering IoT-enabled solutions at scale for building, grid, industry and data-center customers.

The platform is open, scalable and interoperable, connecting Schneider Electric’s own technologies, from connected products, to edge control, to applications, analytics and services, as well as being ready to connect with new partners.

A key element of ecosystems is the way that they’re redefining the boundaries of traditional industries, bringing together players in new and often unexpected configurations. For a sector that’s been accustomed to working competitively by carefully safeguarding its key intellectual assets, the new ecosystems coalescing today require a shift in mindset. Open, not closed, development is fundamental. That means using an application program interface (API) to integrate with others, joining and nurturing open-source projects and collaborating openly with customers across AI-enabled and social media platforms.

• Understand customer preferences and extend organization’s reach into relevant ecosystems of products/services that customers want.

• Assess existing ecosystems and identify how and where to partner with others to offer more products as a service.

• Operate platform to enable asymmetrical growth. Extend platform outreach to realize incremental revenues and identify parts of the business prime for platform business models.

• Where appropriate, define and build a technology architecture for platforms including data gateways / APIs that can expose data externally.

• Move to a multi-speed IT model with a real-time, synchronous architecture in order to link to ecosystem partners. Contribute to ecosystem and assess additional areas to improve the customer journey through ecosystem relationships.

• Understand what data is needed and how to surface that data so it can be shared internally and externally.

• Reposition technology to a more central role reporting to the CEO to verify that IT both facilitates and addresses the business agenda. Present to C-suite leaders the business opportunities originating from technology, including a digital platform strategy.
On-demand platforms and online work management solutions are surging, resulting in leading companies dissolving traditional hierarchies and replacing them with talent marketplaces. This trend is driving the most profound economic transformation since the Industrial Revolution.
Research for the Accenture Technology Vision 2017 finds that industrial equipment companies are, compared with other sectors, among the least likely to think of their organizations as structured along traditional, hierarchical lines.

This may be partly explained by the fact that for years, if not decades, industrial equipment businesses have managed complex supply-chains, integrating numerous partners. What’s more, many also operate with extensive and sophisticated networks of dealers to which they outsource many customer-facing activities. In one sense, it’s an early incarnation of what we call the liquid workforce.

However, today’s digital demands require all companies, in all sectors, to re-evaluate the workforce they need to lead their business with new, intelligent capabilities. These skills are in high demand. The digital natives are able to cherrypick and attract many of the strongest candidates. Consequently, an industrial manufacturer based outside the major metropolitan areas may struggle to win the war for talent with a conventional approach. They need to do something different.

This is where the workforce marketplace comes into its own. There are three dimensions to this, all taking advantage of innovative digital technologies: new ways of structuring work, dynamic sourcing strategies, and adding and renewing skills through continuous learning.

Siemens is an example of a company that’s implementing new ways of structuring work and tapping into new sources of talent and ideas. Through its Spigit platform, Siemens launched the Mobility IDEA Contest in order to find innovative solutions for some of the toughest challenges facing the traffic industry. By casting its net as wide as possible, the company gained access to a wealth of external ideas coming from a variety of skilled employees, from engineers to data scientists, who provided ideas for mobility solutions that traditional approaches would have taken years to find.

Looking at dynamic sourcing from a different perspective means taking advantage of the platforms available to tap into on-demand resources for specific projects. For instance, Airbus uses Gigster’s AI-driven on-demand platform for its hiring of software developers and product managers on an ad hoc basis.

The third dimension of this workforce management trend sees digital technologies deployed to enable continuous learning within the organization. Caterpillar University, for example, provides a full suite of e-learning tools and resources, including videos, interactive training and virtual simulations, making them available to employees and customers alike.

In an industry where widespread disruption is inevitable, all companies need to be actively considering how to develop workforce strategies that provide them with the maximum amount of agility and responsiveness.

**RECOMMENDATIONS**

- Deconstruct the organization and categorize the nature of work associated with specific roles. Understand relative complexity of tasks.
- Orient roles towards dynamic “next best task” execution, rather than based on static tasks. Shift least differentiating tasks to external organizations, as a service.
- Understand sourcing requirements for new ways of structuring work. Take tasks to restructure, identify sourcing partners who can support a “people-as-a-service” model, establish frameworks to allocate work.
- Enable external talent pool to complete tasks through technology. Pilot allocating tasks to complete work in a distributed model. Analyze business benefits and adjust task distribution to partner with right organizations and individuals.
- Understand in-demand skills within the organization and define a training strategy for employees. Pilot new tools and training modules to determine the most efficient and effective ways to deliver training.
- Adopt an any-device, anywhere policy for training, including employee-owned devices. Design and build training both easy to digest and specific to roles/tasks. Build training in a people-first way, easily accessible: for everyone, from everywhere, at any time.
Technology design decisions are being made by humans for humans. Rather than us having to adapt our behavior to suit the demands of technology, the opposite is increasingly taking place. Technology is adapting to how we behave, and learning from us to enhance our lives and work, making them richer and more fulfilling.
Nearly 80 percent of executives in the industrial equipment sector strongly agree that organizations that can truly tap into what motivates human behavior and design the customer experience accordingly will be the next industry leaders. Technology will be a critical enabler. 81 percent of respondents agreed that a new competitive differentiator is understanding the context in the customer experience and creating technology capabilities that align to human behavior. For these companies, there are two key dimensions for delivering on this promise. The first is to create human-centric customer journeys, and the second is to do the same for employees.

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Companies typically concentrate most effort on the former. And they’re using a range of technologies to make sure the customer is at the center of product and service design. Schneider Electric, for example, launched an app—MySchneider—that helps customers to access training, product and technical information and support.

Siemens, too, is bringing physical and virtual worlds together in its product lifecycle management (PLM) software. Products can be developed based on human centric journeys and tested virtually by the user community before they’re built in the real world. That means accelerating time to market by up to 50 percent.

In this new world, aligning the strengths of people and machines is increasingly important. That’s what ABB has done with the development of YuMi, arguably the world’s first truly collaborative robot. YuMi works alongside people in a manufacturing environment, helping companies to bring their employees and automation closer together in order to meet the new imperatives of flexible and just-in-time consumer-driven manufacturing. But rather than replacing people on the assembly line, YuMi augments their strengths, helping people to do more.

Net, companies will have to make fundamental shifts in the ways they think about their business.

**Recommendations**

- Continuously monitor the advances and anticipate how business models could be disrupted.
- Along with shifting toward an experimental approach, commit to transparency as they begin to respond to human behavior.
- Explore business strategies that will enable the pivot from offering products to providing outcomes.
- Leverage business partners, connected ecosystems, advanced analytics and new data streams from smart products in the field to gain timely insights about customer and employee needs and behaviors.
To flourish in today’s ecosystem-driven digital economy, businesses must travel into uncharted territory. Instead of focusing solely on introducing new products and services, they need to think bigger. Doing that will help them seize opportunities to establish the rules and standards that will put them in the driving seat in entirely new industries.
The pace of technology change is radically reshaping industries and giving birth to new ones. As it does so, it’s also creating new responsibilities and exposing deficiencies in current regulation unable to keep up with developments. Companies have an obligation to help bridge this gap. That means working alongside regulators, governments and, crucially, customers.

Companies also have a responsibility to ethically manage and use the vast amounts of data that new technologies are generating. Transparency has never been more important. Industrial companies will need to look seriously at new technologies, such as blockchain, that could help them to operate in distributed manufacturing contexts in a transparent and trusted way.

This is the ideal. But there’s a lot of ground to cover before these kinds of initiatives permeate corporate cultures. For example, our research shows that over a quarter of industrial equipment executives admit that their data privacy codes and policies are reviewed less than once a year. In a digital world, a year is a very long time.

As companies in this industry move from providing products to delivering services and outcomes, manufacturing capabilities will be less of a differentiator. So what will that leave industrial equipment businesses with? Increasingly, it’s likely that core functions such as sales, marketing and R&D will be key sources of business value. It will be essential to find innovative ways of monetizing them, while protecting core intellectual property. What they do will change. So will how they do it. In a software-driven environment, 10-year release cycles will seem increasingly monolithic. New, more iterative and agile approaches to product development and release will be essential. As will using customer data to continuously shape and refine services, often in collaboration with those same customers.

It’s a very different world. Companies that move now to take the lead will find a place at or near the center of their new ecosystem. Those that don’t risk being left behind.

**RECOMMENDATIONS**

- Understand how your products and services influence society. Highlight your areas of innovation where improving government regulation or industry/ecosystem rules would encourage innovation or economic growth.

- Build a conscious strategy for influencing the social contract with a governance structure that verifies responsible and ethical influence.

- Understand how data is being used. Rewrite policies to align with business strategy and reinforce customer trust.

- Leverage blockchain and similar technologies for trusted transaction between different stakeholders.
These themes represent the newest expression of Accenture’s People First view of the changing digital landscape. As part of Accenture’s multi-year perspective on technology’s impact on enterprise, they reflect the continuously evolving digital culture that creates challenges and opportunities for Industrial Equipment companies worldwide.

Each individual theme from each year highlights the evolution of a key technology. Some of these are already playing important roles in the strategies of leading Industrial Equipment companies, while others are just beginning to make an impact, or are impacting organizations in unexpected ways. Viewed as a whole, our Technology Vision themes provide a guidepost for the way Industrial Equipment companies must consider their resources, responsibilities, and opportunities for success in the years to come.

With our world in a state of change at every level, being a leader isn’t just about incorporating new technologies. It’s about finding a place in the next evolution of society, by empowering people—your people, whether they are customers or employees—and becoming a partner, embedded throughout everyday life. The world will continue to evolve, but leading enterprises that embrace this deeper dive into a People First mindset can find benefits at every scale. Across every industry, at every level of business, one thing companies have in common is people