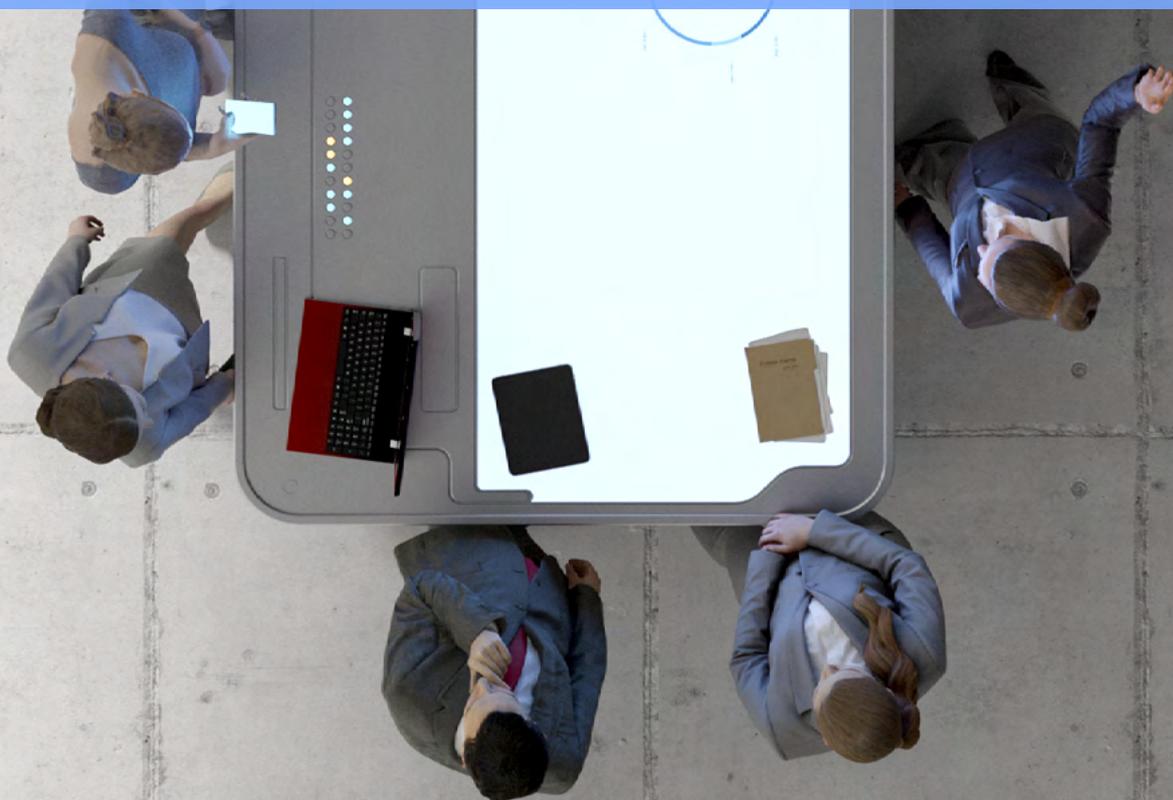




IBM Institute for
Business Value

The Virtual Enterprise

The Creativity of Inclusive
Human-Technology Partnerships



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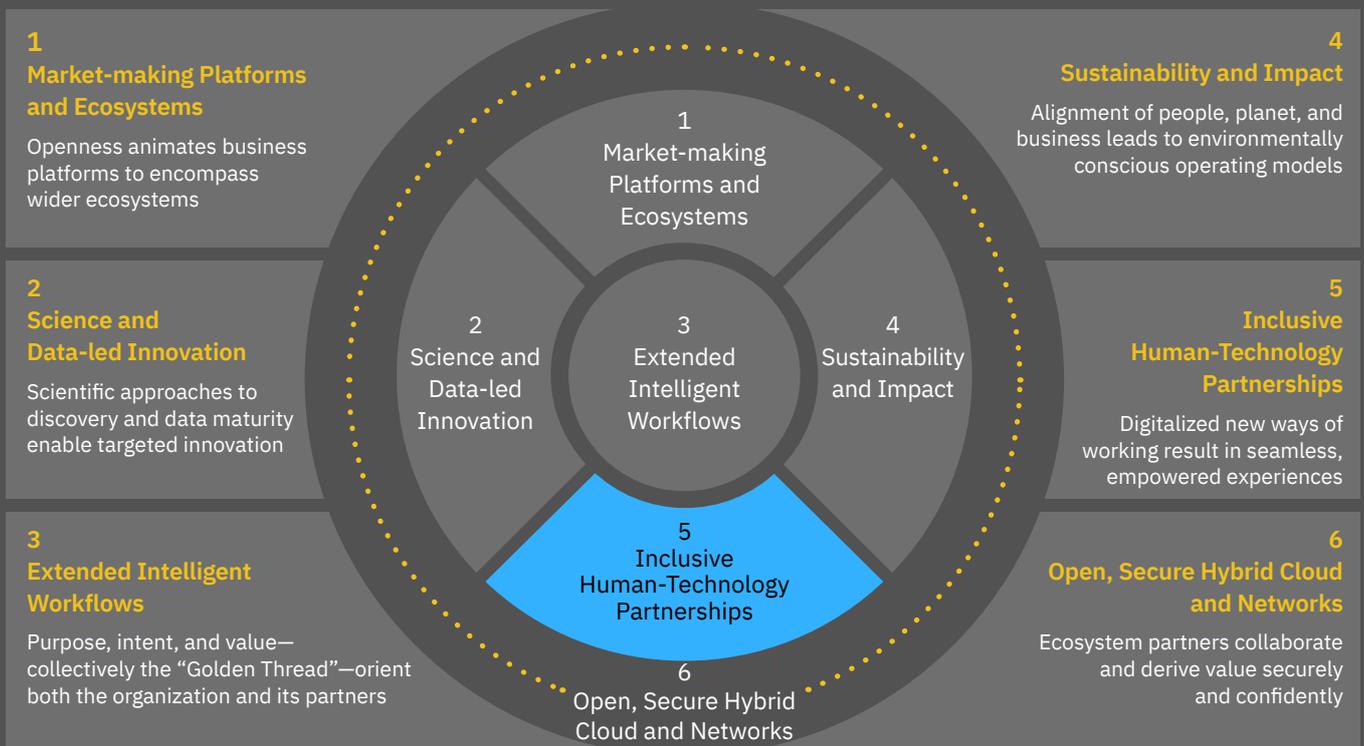
Technology is transforming the business models of enterprises across the globe, creating new opportunities for growth and fresh benchmarks of productivity, engagement, cost, and efficiency. The ability to apply AI, automation, blockchain, the Internet of Things, 5G, cloud, and quantum computing at scale has made the promise of Cognitive Enterprises real.

As we place this revolution in the context of an increasingly virtual world, we see even more power arising from the ecosystems, digital workflows, and networked organizations that are made possible. The Virtual Enterprise is emerging, supported by a “Golden Thread” of value that animates the enterprise and binds ecosystem participants (see Figure 1).

The Virtual Enterprise embraces the new digital tools and ways of working that have become the norm during the pandemic. It takes advantage of the accelerated reset of human-technology interfaces, including digital channels to customers and seamless virtual working across processes. It also recognizes the need to build new forms of leadership, inspiration, engagement, and connection to deal with the exacerbated challenges of human empathy, creativity, and sense of belonging that have come with increased digital engagement.

Figure 1

Building blocks of the Virtual Enterprise



The Virtual Enterprise makes ecosystems the heart of its strategy to enhance innovation, make markets, and massively enhance capabilities.

How inclusive human-technology partnerships can create a competitive edge

The Virtual Enterprise relies on new interfaces among people, ecosystems, and the exponential technologies they access. As location becomes less important, the opportunity to access skills and capabilities from anywhere becomes real. This extended access has huge potential for unlocking new value and discovering new solutions. The effectiveness of this dynamic collaboration requires robust and defined workflows and easy-to-use tools and systems.

For people, the Virtual Enterprise is both an opportunity and a threat. There is a chance to bring your skills to bear in new areas through the power of global connectivity, but likewise the access to skills that can out-perform your own is easier too. Thus, it steps up the imperative for continuous and extended learning, as well as the alignment of agile approaches. The concept of the employee is open to reconsideration in a manner that extends beyond the gig economy to a deliberate structural approach to organization and capability building. The Virtual Enterprise will thus need a clear, reinvented, and open workforce strategy.

Virtual Enterprises need to be entities where leaders, employees, and stakeholders have a renewed trust in data and technology as key drivers of decision making and the core rules of the operating model. Digital workers and AI bots will make more decisions that have greater impact. Being able to build these in a way that is predictable, contextual, and progressive will be a challenge.

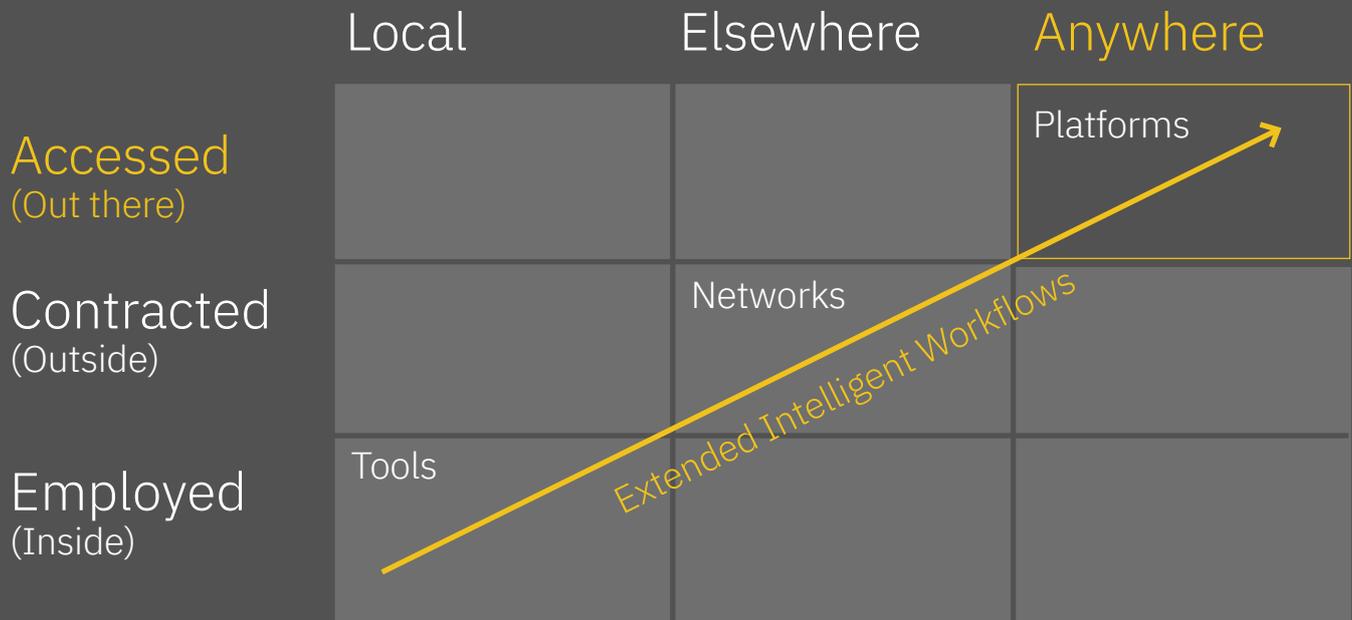
What are inclusive human-technology partnerships?

Digitization introduces challenges for traditional workflows, as tasks once performed by people are taken up by machines. Resistance and fear could ensue. But, if implemented appropriately, technology can improve both productivity and the workforce experience.

Inclusive human-technology partnerships will define the virtual organization of tomorrow. They prioritize the positive potential of an organization's people and its ecosystems. By implementing new systems and tools with empathy and intentionality, leaders can enable the best of machines and the best of humans—optimizing outcomes, talent effectiveness, workforce diversity, and work-life balance.

Figure 2

Evolution of human-technology partnerships



Very importantly, the Virtual Enterprise has the potential to be a massive accelerator of inclusion and diversity as different divisions, organizations, geographies, and backgrounds get to engage in the extended workflows and new organization constructs that are created. There is an opportunity to create new “on ramps” to the global economy for people and businesses that are currently excluded through trusted open platforms and extended workflows.

But the openness potential in this area is not simply driven by the technology or platform attractiveness. There needs to be a deep underlying openness in the culture and values of the organization and its ecosystem. Poorly considered or narrow definitions of the Virtual Enterprise team can actually damage the diversity of the group if group think thrives in remote, disconnected bubbles.

As extreme automation, digitization, and algorithms become the norm and people are fragmented into more remote work environments, there is, of course, a risk that the humanity of the Virtual Enterprise will come under pressure. We can see that some of the new work models have already stretched the ability of teams and individuals to cope with the blurred worlds of home and work.

The Virtual Enterprise and its leadership will need to proactively put the “human” back in the machine. As a more hybrid work environment becomes standard, office location, design, and scaling will become more complex, as will the balance between open spaces and privacy (see Figure 2).

Building a strong corporate culture will require a new playbook as the enterprise becomes increasingly virtual. Leaders will be challenged to instill a positive corporate identity among a workforce that spans the globe and includes employees who perhaps only meet virtually. Clear communication, leading by example, and continuous feedback to foster employee growth will be crucial to establishing a winning culture and a clear path to competitive advantage.

Building a collaborative modern culture

The way we work and interface with one another is changing rapidly, accelerated by the virtualization of customer and employee interactions. New possibilities for work and collaboration, including the ability to work anywhere and anytime, compel organizations to re-examine existing processes and create new ones across the ecosystem with partners.

For the Virtual Enterprise, this is an exciting and unmistakable opportunity—a chance to build a more modern, effective, and collaborative culture that amplifies human talents through the skilled, intentional implementation of technology.

In a recent IBV study, more than half of C-suite executives report they intend to tap anywhere-anytime talent pools for specialized skills over the next 3 years.¹ Yet the virtualization of work has created both opportunities and challenges for organizations and employees. C-suite executives estimate that, by 2023, 14% of their workforce will require retraining or reskilling annually. As a result, organizations are creating cultures of continuous and extended learning to attract, develop, and retain top talent.

For those who have been excluded from the workforce, tech-enabled ecosystems extend an invitation to the global economy by removing the need to migrate to access economic opportunity. 25% of organizations already leverage talent and skills through ecosystem partners, and another 41% plan to do so within the next 3 years.²

The extended talent pool made available through virtual models helps organizations close critical skills gaps. It also can provide a pipeline of diverse candidates poised to inspire positive change, innovation, and creativity in the workplace.

The Virtual Enterprise dramatically reconceives the human-machine relationship, based on heightened automation tools and intelligent workflows. Individuals now expect to interact with workplace systems with ease and immediacy. They demand greater flexibility and autonomy in when, where, and how they work—a networked system with the tools to collaborate, innovate, and succeed.

Forward-looking enterprises use automation and AI as core to this effort, augmenting the key strengths of human talent and empowering people to focus on what's important. Intelligent automation enables an entire organization to be “always on,” optimizing the delivery of goods and services for seamless continuity in dynamic markets. Workflows become the backbone of trusted information and relationships and the repository of the automated rules and algorithms that drive crucial, in-the-moment decision making.

What differentiates leaders

Leading enterprises are always on the hunt for ways to work smarter and faster, and to build more adaptable, resilient operations. That includes digitally augmenting the workforce to handle spikes in demand or declines in capacity, as well as shifting workers within and between industries in a dynamic market.

Digitization unleashes new workforce potential while also introducing new challenges related to empathy, sense of belonging, and human connection. In this way, working relationships and collaboration have been both enabled and tested by ever-advancing software and technology. Leaders should maintain balance within the human-technology partnership—taking a human-centric approach that considers physical, mental, and emotional health alongside bottom-line performance metrics.

Leading enterprises integrate AI, cloud, and automation technologies to enable this new reality, empowering intelligent workflows fueled with data. This allows for the creation of new, agile business models and serves as the Golden Thread of value within the Virtual Enterprise, shaping the future of how work is performed.

We found that successful leadership depends on 4 priorities:

Culture awareness: 89% of leading organizations realize they must transform their culture and processes, as well as reskill and retrain employees, to receive the full value of intelligent automation.³ This includes the responsible use of new tech tools and avoiding demographic inequities and biases.

Authentic communication: Just 34% of executives say communication from their organizations' leadership comes across as authentic and empathetic.⁴ Leaders must provide personalized engagement and deliberately foster an inclusive, positive workplace culture in a talent marketplace where employees have more freedom of choice than ever.

Intelligent technology: As much as 12% of routine tasks and 11% of simple business decisions are expected to be performed by intelligent machines by 2023, compared to 7% and 6% in 2017, respectively.⁵ Entrusting more tasks to intelligent machines could free up people to focus on higher-value work.

Workflow automation: Enterprises plan to entrust automation with complex, cross-enterprise work at 7 times the current rate by 2023, according to a recent IBV study.⁶

By striking the right balance between human and digital labor, the Virtual Enterprise can enable accelerated productivity, collaboration, and creativity—building a more flexible, inclusive, and impactful workforce.

We identified 3 key insights that guide the Virtual Enterprise in achieving this balance. They are centered on:

- **Workflows**
- **Decision making**
- **Leadership**

Digitized workflows can improve revenue

The pandemic has accelerated the virtualization of customer and employee interactions and shaped durable new ways of working.



The Virtual Enterprise deploys technology to improve the effectiveness of its human workforce, enhancing efficiency and creativity. By investing in a future-focused culture, the organization can become better positioned to deliver long-term positive outcomes and attract inclusive worldwide talent.

These efforts can produce enhanced business results, as recent IBV research shows: Leading technology adopters who succeed at reskilling employees for technology-driven changes achieve a revenue growth rate premium of 15%.⁷

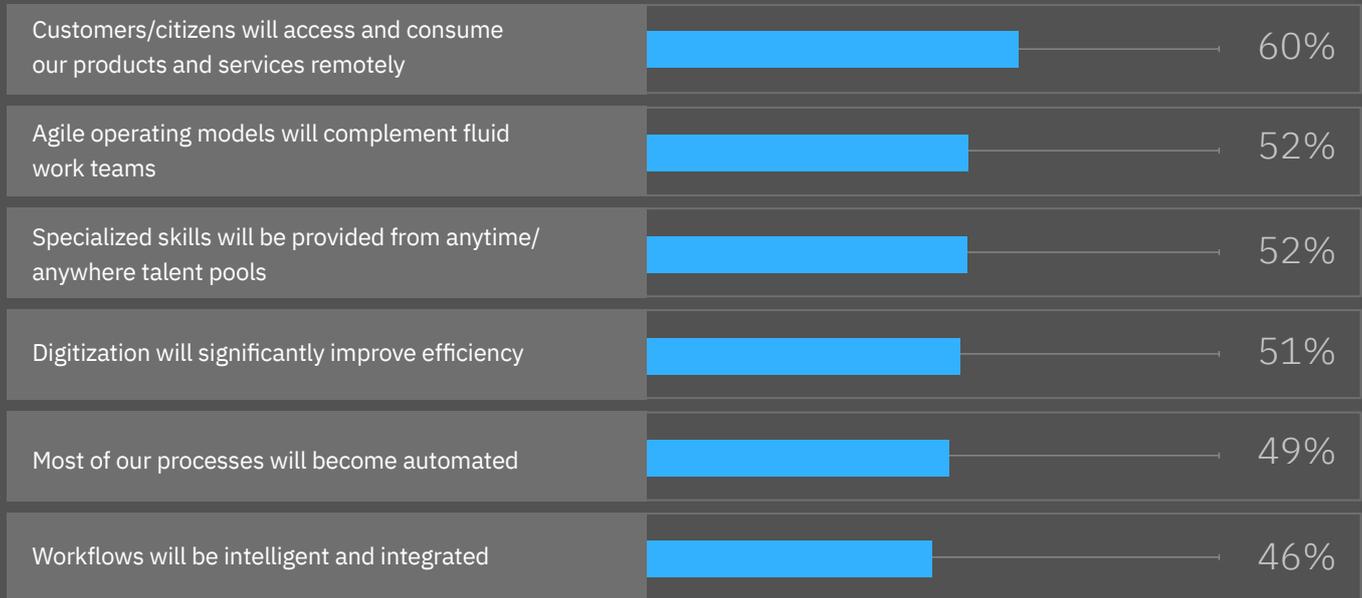
The pandemic has introduced wide-ranging business disruption. Individuals and employers have struggled to identify sustainable ways to work, play, and live while staying safe and healthy. For executives, it can seem almost impossible to balance each employee's needs with rebuilding and growing the business. The increasing virtualization of the workforce requires new hybrid ways of working, reskilling, and retraining, as well as differentiated talent management.

Automated workflows can help overcome these challenges. Half of organizations cite “technology-infused workflows” as one of their most important competitive advantages in the next 3 years.⁸ Extending the scope of a workflow and creating end-to-end connectivity between the workflow's customers and ecosystem could bolster business outcomes.

Digitization of workflows supports virtually all areas of talent management—including attracting, training, and reskilling. It allows organizations to tap skills and capabilities from anywhere and take advantage of new opportunities to foster diversity and inclusion. As exponential technologies, new business models, and global disruptions converge to transform the enterprise, it has become more important than ever before to elevate the work that humans do and the skills that they need (see Figure 3).

Figure 3

Hybrid work and hybrid consumer consumption require agility and digitization



Source: Previously unpublished data from the 2021 IBM Institute for Business Value Virtual Enterprise Survey. Q: To what extent do you agree with the above statements?

How effectively are you digitizing your workflows?

Q1 How are you planning for and modeling the impacts of hybrid work environments within the enterprise and across networks and ecosystems?

Q2 How is your organization prioritizing workflow automation? And to what degree does your workflow automation require new talent acquisition or workforce reskilling?

Q3 How are you integrating your investment in new technologies with investments in workforce development, training, and engagement?

Siemens AG

Supporting workers with a virtual agent

As part of its digital transformation initiative, Siemens AG has integrated automation and AI into many of its processes to deliver exceptional service to customers and employees. The company's People & Organization (P&O) leaders continuously embrace change and digital technologies to support their 293,000 people worldwide. Leaders brought their teams into the design process to provide employees with interactive experiences and quicker, more accurate answers to questions—regardless of location, device, or time of day.

As a result, Siemens created CARL, an AI-based HR virtual agent. Just 3 months after being developed, CARL made its debut in 2017 to an audience of 120,000 people in Siemens locations in Germany and Austria. And it has been significantly enhanced and rolled out to additional countries since then.

In keeping with design thinking practices, the development team prioritized the user experience in creating and enhancing CARL. The team initially programmed the chatbot to address 5 key topics that Siemens employees in Europe most often inquired about. But from the very beginning, CARL's architecture was designed to easily scale and adapt to accommodate increasing numbers of users, languages, and topics as it expanded to other Siemens sites. Today, CARL is available to over 290,000 people globally and in 17 languages, covering countless topics.

Siemens also decided to implement a global human capital management (HCM) cloud platform. By doing so, Siemens simplified and harmonized global P&O policies and processes to create a standardized digital platform for HCM.

Today, Siemens people across 38 countries can access self-service HR capabilities securely and conveniently through their device of choice.



Decision making must be shared—and trusted



The virtualization of work has opened up new opportunities and challenges for organizations and employees alike, where global capabilities can be accessed with greater ease.

No aspect of the Virtual Enterprise is more fraught—or full of more potential—than AI-driven decision making: What decisions must be made by humans, and what can be deferred to machines? This evolving area is a core element of human-technology partnerships.

The expansion of machine-led decisions is inevitable. Dynamic networks and services increasingly rely on automated processes and tools. There has been a massive explosion of data sources, born out of extreme digitization and providing the opportunity to resolve complex problems and seek new solutions.

As AI and machine learning are applied to this huge universe of input, the potential for pattern recognition and workflow optimization becomes clearer. Data-led analysis of customer behavior can reshape a service proposition; monitoring performance can highlight areas for improvement.

Almost 4 in 5 surveyed executives (78%) expect that intelligent machines will make complex or mission-critical decisions by 2023.⁹

Yet the human factor remains equally central. And it could come under increasing pressure, as extreme automation, digitization, and algorithms become the norm and people become more fragmented within remote work environments. Leadership will need to embrace and proactively tackle these challenges.

Focusing on the human side of the human-machine partnership is essential to both quality outcomes and trust in those outcomes.

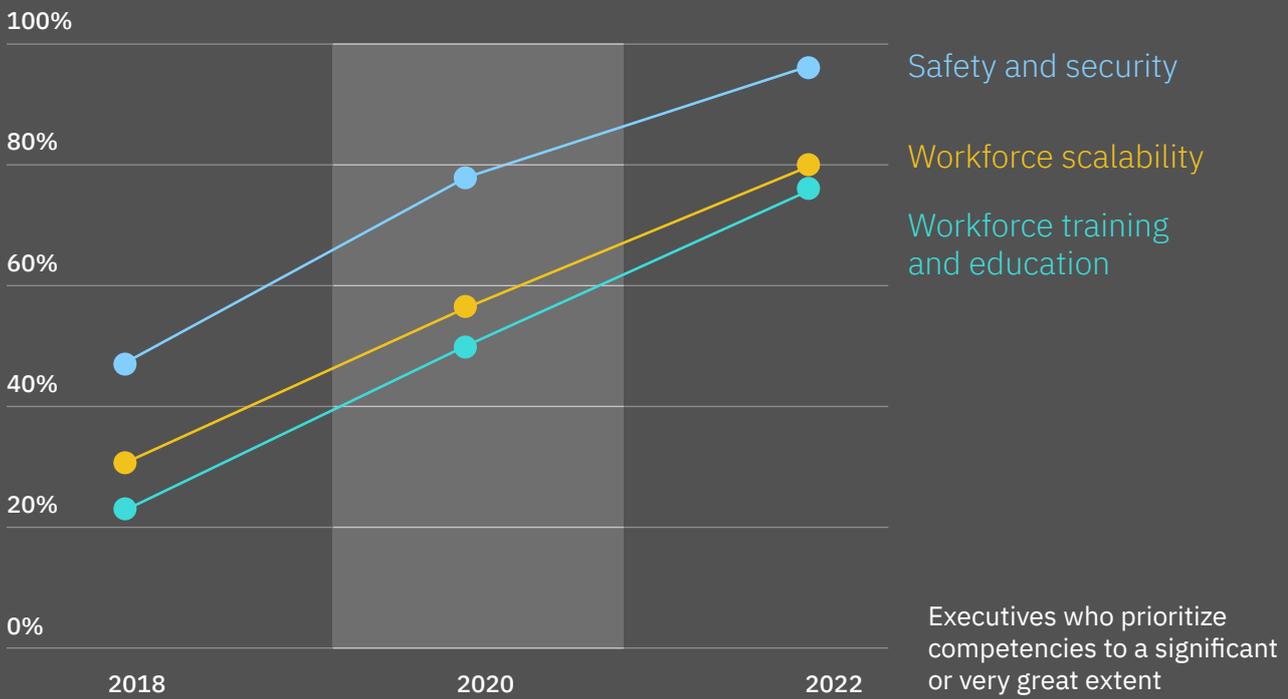
Most executives understand that their people play a significant role in helping them manage economic turmoil, and they're prioritizing workforce capabilities accordingly. In fact, workforce safety and security is the top executive priority, with 92% of surveyed executives planning to prioritize this capability by 2022.¹⁰ And nearly four fifths are putting a premium on workforce training and education (see Figure 4).

With data and information as the raw materials of the new automated decision making, the value of that data is hugely dependent upon the transparency, trust, and security of the sources (enterprises, partner ecosystems, or customer insights). Business leaders must have trust in data and technology to help drive decision-making rules for business operating models.

It is in linking the tech inputs and the human inputs that the Virtual Enterprise distinguishes itself. Intelligent workflows provide the workforce—both digital and human—with visibility and data transparency to uncover real-time insights and dynamically adjust with both self-learning and self-calibration. Indeed, the modeling of human-machine interactions, via operational automation, allows the Virtual Enterprise to simulate and analyze improved efficiencies and outcomes.

Figure 4

Executives shift their focus toward workforce-related competencies



Source: "Closing the chasm: Executives and employees don't see eye-to-eye on employer responses to COVID-19." IBM Institute for Business Value. ibm.co/closing-chasm

How are you enabling both AI-led and human-led decision making?

Q1 How does your organization delineate the decision-making authority of software and AI versus human talent? How are you advancing machine-led decision making while protecting against potential bias in data and software?

Q2 How are you enabling scientific practices and reliable, secure data sources so your workforce, partnerships, and ecosystems can engage in constant discovery and innovation?

Q3 How are you preparing your workforce and your executives for the speed of automation-led decision making? And what fail-safes are being contemplated and implemented?

Medtronic

Delivering innovative HR solutions

With more than 90,000 employees in 150 countries, Medtronic develops and manufactures devices and therapies for the treatment of more than 70 of the world's most complex and challenging health conditions. To support Medtronic's enterprise-wide business transformation, its HR organization has implemented the IBM Garage model for delivering solutions that matter at scale.

HR aimed to promote new, collaborative ways of working through the rapid evolution of innovative solutions. It maintained a repeatable cadence that continuously identified new use cases for improving the experience of HR customers and delivering positive business outcomes.

By applying IBM Garage principles such as design thinking, agile methods, and co-creation with HR stakeholders, Medtronic HR was able to establish a shared vision for improved HR service and support that put employees and managers at the heart of value-driven enhancements to processes and tools.

This innovation-driven delivery method is now the engine for the digital enablement of HR and a model for value-based, agile solution development in the enterprise. It has led to simplified processes, improved customer experience, and significant time and efficiency savings. And Medtronic HR now has an innovation pipeline to explore ideas and help realize value.



Leadership requires empathetic engagement



New hybrid ways of working are emerging and will require new tools and rules of engagement for people, teams, and organizations.

The Virtual Enterprise is not an unfeeling place. On the contrary, it instantiates empathy as a key animator for the openness, discovery, and creativity that enable value creation and societal impact.

Virtualization brings the enterprise into the homes and workplaces of customers, employees, and partners. The multifaceted roles of offices, teams, and locations have all been redefined recently. That evolution will only accelerate as technology advances and new models of interaction emerge for reimagined collaboration and work.

For some individuals, the lines between home and work have become less clear as they adopt and adjust to new ways of working. While virtual work has enhanced some collaborations, such as co-working on projects or transactions, the organizational glue of empathy and networking may be at risk of eroding.

That all puts new pressure on leadership to rethink organizational culture. As a recent IBV study reports, 41% of executives say they are focused on developing a culture rooted in empathy, adaptability, and innovation.¹¹

Empathetic leadership puts employee safety and wellness first—and uses technology to do so. Despite anxiety that technology could displace some workers,

autonomous and drone vehicles, along with augmented technologies, are supplementing human activities in industrial products, mining, and energy. These technologies not only reduce carbon output but improve workforce safety and wellness.

The Virtual Enterprise also has opened up opportunities to tap skills and capabilities from anywhere via digital workflows. This extended access stretches across the organization, partner organizations, and the wider community—providing access to diverse talent and disrupting old paradigms in talent management. New work opportunities are created, drawing on global talent pools and offering greater diversity and inclusion.

Extended automation, connectivity, and transparency can also promote human expression and engagement across the workforce. With an explicit recognition of health and wellness and work-model flexibility as high priorities, organizations can build a new, “open” workforce strategy. Organizations that nurture their employees’ various skillsets—digital, cognitive, social, emotional, adaptability, and resilience—will position themselves for competitive advantage (see Figure 5).

Figure 5

The growing importance of soft skills



Source: Previously unpublished data from the 2021 IBM Institute for Business Value Virtual Enterprise Survey. Q: What are the most important workforce skills in a post-pandemic world?

How are you developing empathetic leadership?

Q1 As virtualization blurs the work-home distinction, how are you amplifying the positive benefits while addressing any negative repercussions?

Q2 How are you nurturing managers' and leaders' soft skills? How open is your organization to the struggles of the workforce?

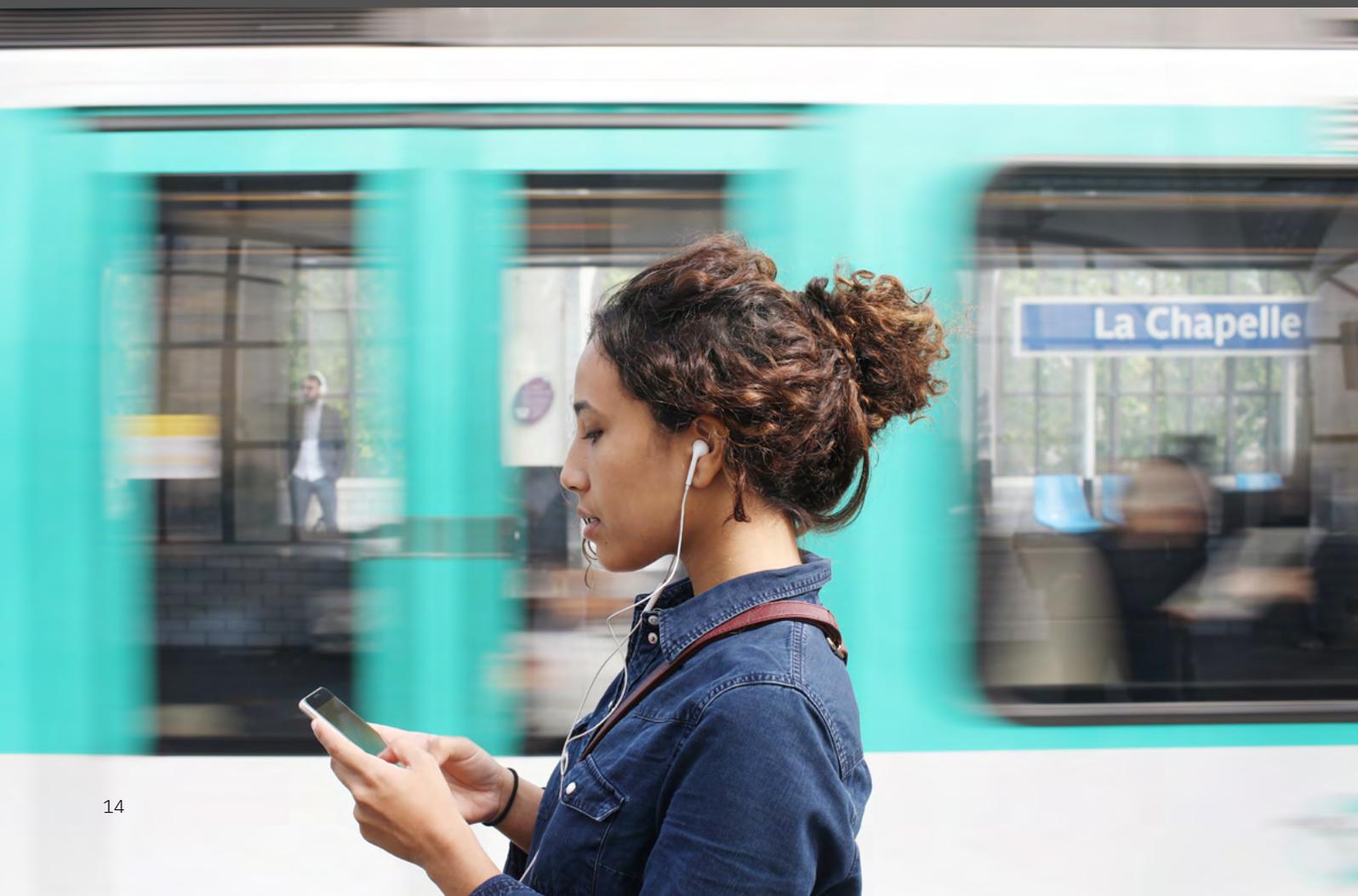
Q3 How are you addressing anxiety about new technologies? And how are you using new technologies to improve the workplace experience?

Orange France

Helping people to partner with tech

A leading national telecom company, Orange France developed a comprehensive Orange Campus program to enhance employees' digital competencies. Using co-creation studios, Orange France formed a vision of how human talent and technology can work together seamlessly. In the process, 150 existing roles were narrowed down to 30 top roles, and 80 digital competencies for tomorrow's workforce were identified.

The results have been impressive. Orange France reorganized training paths and boosted career mobility by helping employees acquire new—and critical—digital skills. 50% of the workforce involved in the digital transformation have achieved new digital skills through Orange Campus. An assortment of new digital offerings helped yield a 150% increase in customer sales, with a 10-point gain in the net promoter score. And Orange France achieved a 30% increase in its digital channel self-service use with full digital assistance.



Action guide

Deepening inclusive human-technology partnerships to gain a competitive advantage

The Virtual Enterprise embraces technology and humanity, leveraging each to amplify the impact of both. Rather than placing people and machines at odds, it puts intentional, consistent effort and investment into melding them into a cohesive, collaborative, and competitive whole.

The pandemic introduced new work models in a matter of weeks, with stresses emerging just as quickly. As work-home distinctions continue to blur, so do both positive and negative repercussions. New hybrid ways of working require new tools and rules of engagement for organizations and their people and teams. Organizations not willing to adapt could fall behind.

Human-technology partnerships enable the Golden Thread of intelligent workflows. Openness within the organization and across ecosystems accelerates the inclusiveness of the workforce and broadens talent access and opportunity.

Technology can be a source of strain but also of solutions, opportunities, and discoveries. Only by optimally balancing the human-machine interplay can organizations of tomorrow reach their full potential—for their employees, stakeholders, and broader society.

Here is a 5-step outline for gaining a competitive advantage by deepening human-technology partnerships:

Reinvent workforce dynamics

- Explore new ways of working to enable flexibility.
- Support and engage talent as it faces strains from work-home disruption.
- Provide continuous learning and skills building, especially related to tech use.

Apply intelligence tools

- Develop intelligent workflows with AI and automation to free up employees for higher-value work.
- Deploy hybrid cloud and other connectivity systems to enable open sharing and transparency internally and across ecosystems.
- Tap data for ongoing insights about processes and the man-machine relationship.

Augment your workforce

- Improve business continuity and outcomes with flexible labor pools and approaches.
- Foster a mindset shift to emphasize enterprise- and ecosystem-wide collaboration and co-creation.
- Leverage experiments and real-time insights.

Orchestrate digital decision making

- Invest in roles and skillsets that align with emerging exponential technologies.
- Clarify where algorithms act independently and where humans make the call.
- Test new capabilities for integrating man-machine expertise.

Foster employee engagement and a culture of inclusion

- Adopt visible supports for diversity, equity, and inclusive business practices.
- Capture and prioritize the breadth of voices across the enterprise.
- Lead with empathy, compassion, and transparency.



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IBM Institute for Business Value

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