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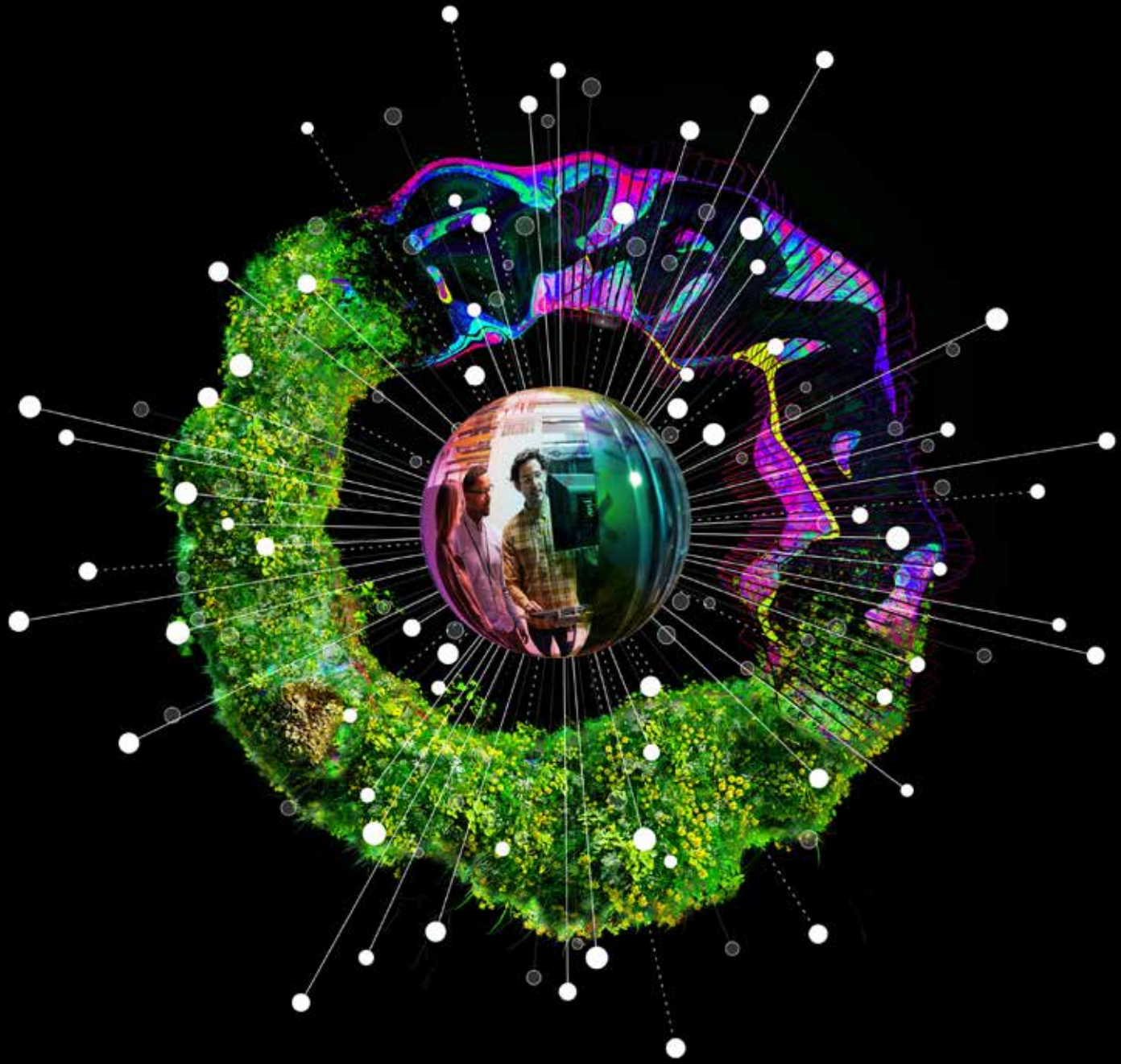

Digital Doppelgangers:

A new way humans and machines can partner to transform work

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Introduction

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In 2021, a musician released a new kind of instrument: An AI version of her voice[1]. Anyone can upload audio of themselves singing and the AI can transform the audio so it sounds like it was sung by the musician. The AI can sing in languages that the musician does not know and in myriad styles of music. While this might seem like another entrant in the growing category of AI tools to generate art, it represents a potentially profound shift in the ways that workers can replicate and extend their capabilities into multiple work contexts at once. For a musician, extending her unique skills through AI could radically reduce constraints on her ability to perform[2]. "Could I be in a thousand different bands in multiple languages," she asked in a recent interview, "and what would that even sound like?[3]"

Think of the musician's AI as an early example of something we could become much more familiar with in the coming years: A digital doppelganger.

Digital doppelgangers represent a new way to approach the application of AI in the workplace. Digital doppelgangers can replicate specific skills, knowledge, and other attributes of an individual or small team. For a musician, this may mean replicating her voice but for other professions, it could mean replicating institutional knowledge, decision-making frameworks, or strategic thinking.

This replication of human knowledge and skills raises unique ethical questions, which we will discuss in more detail below, but the goal is for digital doppelgangers to partner with human counterparts to benefit organizations and workers alike. For organizations, digital doppelgangers can help to overcome talent scarcity gaps and enable growth. For workers, digital doppelgangers can provide a new kind of personalized, highly-capable job assistance that can help them to become more productive while pursuing activities that increase their engagement, sense of purpose, well-being, and earning power.

From automating tasks to replicating skills: the next evolution of digital workers

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Many organizations have already deployed digital workers in the form of automation and AI capabilities to perform routine tasks like invoicing. And increasingly, organizations are looking to move beyond simply automating tasks to enabling digital workers to take on more sophisticated activities, such as analyzing and learning from large datasets or providing frontline support to customers. These digital workers can be a powerful complement to human workers. They can operate without error, handle fluctuations in workload, generate new insights, and work faster and longer than their human counterparts. Perhaps more importantly, some are already helping to elevate the role of humans in the workplace by creating the capacity for workers to focus on the things they enjoy doing.

But today's digital workers are not yet able to handle dynamic situations. They lack personality, awareness, and struggle with ambiguity and complex scenarios. Their knowledge is domain-specific and designed to tackle discrete tasks and processes, but they lack expertise and deep subject matter knowledge. They can learn from large data sets but not directly from experts.

In other words, today's digital workers excel at completing pre-determined tasks but lack the training and skills to do more open-ended work. In the coming years, organizations will likely look to develop digital doppelgangers capable of overcoming these limitations by focusing on adding at least a few distinct qualities:

Acquiring and applying knowledge. Today's most sophisticated AI systems learn from enormous data sets that make them powerful general-purpose tools. Digital doppelgangers learn through deeper, individualized training. For instance, to train the music AI mentioned earlier, the musician recorded specific vocal phrases and sounds to enable her digital doppelganger to have a deeper, more accurate sound than an AI voice derived from publicly available datasets[4]. In a business context, this kind of approach—where individuals provide deeper, more intentional training of an AI through active efforts as well as passive monitoring—can enable the digital doppelgangers to help with more context-rich work, such as finding ways to improve a process, formulate new business development ideas, create new content, translate business requests into technical user stories, and more.

Awareness and context. Digital doppelgangers are not sentient, but they can have an awareness of their human counterparts and the environment they operate within. For example, digital doppelgangers could recognize cultural cues, behaviors, and sentiment and adjust how they interact with different people based on the subtle changes their human counterparts demonstrate in similar situations. We already have examples where machines are learning comparable skills from data, such as Google's Language Model for Dialogue Applications, or LaMDA, which analyzes human dialogue to engage in open-ended conversation[5]. The next frontier is expected to feature machines advancing these capabilities by working directly with humans on a smaller, more intimate scale instead of learning exclusively from big data.

Personality and relatability. A digital doppelganger not only acquires knowledge from their human counterparts and surroundings, but could also replicate personality traits and unique characteristics by monitoring and mimicking interactions between people. In 2020, Microsoft received a patent for a technology that can mimic an individual based on their social media profiles[6]. In the future, digital doppelgangers could develop their personality from human counterparts via direct observation. By developing a personality based on their real-world counterparts, digital doppelgangers would be better equipped to overcome the "uncanny valley" problem and increase the adoption and comfort-levels associated with humans and machines working together[7].

The Emergence of Digital Doppelgangers

Many of the building blocks required to develop digital doppelgangers are available today and used to create digital workers. Robotic process automation executes tasks, natural language processing enables interactions with humans and other machines, sensory tools allow machines to navigate physical and virtual environments, cognitive engines and machine learning autonomously analyze and use data to improve outcomes.

The key to unlocking the potential of digital doppelgangers is to focus on using AI to replicate human capabilities – and to do so by enabling digital doppelgangers to learn directly and organically from their counterparts. These early experiments highlight how the digital doppelganger concept is already starting to come to life:

- Microsoft has pioneered a teaching approach to make it easier and more intuitive for human experts to transition their knowledge to machines. The goal is to enable humans to teach machines the same way they would teach another person[8].
- Paradox.ai used a real person to inspire the development of their Olivia AI assistant. Olivia was built to guide candidates, hiring managers, and recruiters through the Talent Acquisition process to save time and improve the experience. The likeness to the human source is an important differentiator for the product[9].
- A team at MIT Media Lab has developed research on replicating a person's digital identity and making it available to operate on behalf of a human source. They refer to the concept as allowing others to "borrow their identity" to provide consultation or to help with decision-making in the absence of the source human[10] .
- Epic Games recently created a MetaHuman version of NBA player Luka Dončić. The avatar is developing a personality using the videos algorithmically curated for Luka's profile on the video sharing app TikTok[11].

The thorny ethics and challenges of replicating a person

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As a thought exercise, imagine if a leading investment advisor was able to deploy digital doppelganger technology to apply their wisdom to real-world decisions across their investments and holding companies. With digital doppelganger technology, the advisor would be able to deploy their wisdom at scale and bring faster and better decision-making across their holdings without any additional work.

Just about every executive would love to consult a digital replication of an accomplished investor before making a complex business decision, but this scenario could be problematic without the right guardrails in place. What happens if the digital doppelganger provides the wrong guidance? Who is financially liable for any losses caused as a result? How would the advisor manage ownership rights and potential profits generated by the digital doppelganger?

In addition to the usual concerns around AI—privacy, bias, and fairness among them—digital doppelgangers can raise thorny issues of their own because of the direct link to real people as the inspiration. Some of these challenges could include:

Property and ownership. The question of the proprietary rights over a digital doppelganger is uncharted territory. Workers will likely feel a sense of ownership for the machines they helped to create in their likeness, and organizations will have a stake by covering the technology investment and enabling the creation. This idea can get particularly messy when workers exit the organization – do they take their digital doppelganger with them? Like other forms of intellectual property created in the workplace, patents, company policy, and employment law are likely to play a significant role in determining ownership. Legal and legislative battles may create new rules for digital doppelgangers that differ from today's rules around intellectual property. Organizations and workers will need to tread carefully as the technology matures and these legal issues get resolved.

Rewards and monetization. Businesses will likely need to incentivize workers to share their knowledge and capabilities with machines in exchange for rewards. To address this, workers could be compensated each time the doppelganger uses knowledge they learned from their human counterpart. Blockchain technology could play a role in recording when digital doppelgangers are used and who should be compensated based on the actions. This approach could help to foster a culture of entrepreneurship and innovation as workers actively seek out opportunities to improve the capabilities of their digital doppelgangers. Things could get trickier as digital doppelgangers are commercialized as revenue channels. Profit and equity sharing programs could be a way to reward workers for contributing to the advancement of a digital doppelganger product, but these programs will need to be carefully planned for and managed to avoid risk.

Oversight and control. Many organizations use human-in-the-loop protocols to monitor the output of digital workers and intervene when machines need help. Likewise, digital workers are trained to alert humans when they encounter scenarios they are unable to handle autonomously. Digital doppelgangers are a little different. They are designed to operate in unprecedented situations and on behalf of a human. How would they know when to reach out for help? To account for this dynamic, organizations should consider designing for human-controlled outcomes. As AI researcher and author Robb Wilson notes, "even if a machine is capable of making efficient decisions on its own, good design keeps humans in the driver's seat"[12]. Establishing governance processes and other mechanisms can help to ensure humans remain accountable for the work of the digital doppelgangers they oversee.

Transparency. Unlike AI applications that operate in the background, digital doppelgangers will likely be designed to interact directly with people and on behalf of people. This has the potential to put humans in the awkward situation of unknowingly interacting with a digital doppelganger. For example, if a worker had a conversation with a digital doppelganger and then expected its human counterpart to remember details of the conversation the next day, this could create confusion, erode trust, and undermine the value of efforts to build digital doppelgangers. When in doubt, organizations should err on the side of disclosing every time a person is interacting with a digital doppelganger. Organizations should also set clear expectations around how to interact with a digital doppelganger relative to human workers.

Replicating bad human behaviors. Digital doppelgangers should be trained on smaller data sets in order to imbue them with skills that mirror those of an individual or small team. The drawback to this approach is that in the process of learning an individual or team's unique skills, the digital doppelganger could also learn some of their idiosyncrasies and bad behavior. This means that digital doppelgangers may have a higher probability of making mistakes compared to AI trained on large data sets. However, organizations could deploy digital doppelgangers in narrow contexts, which can limit the potential impacts of mistakes even if mistakes are more common. This is an important concept for organizations and human counterparts to grasp, as it will be their responsibility to ensure digital doppelgangers are staying inbounds and continuously learning to address issues as they arise. It also provides another reason that it will be important to keep humans accountable for the outcomes of work performed by digital doppelgangers.

Unsurprisingly, "managing AI-related risks" was cited as the top challenge among respondents for scaling AI initiatives in Deloitte's 5th annual State of AI report[13]. Business and technology leaders should continually revisit how to manage questions around AI governance, but they should begin thinking about their digital doppelganger strategy now to mitigate potential risks in the future. Organizations should get ahead of these challenges with the lead time to experiment and iterate before digital doppelgangers become a more substantial part of the workforce.

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Reimagining work with a digital doppelganger

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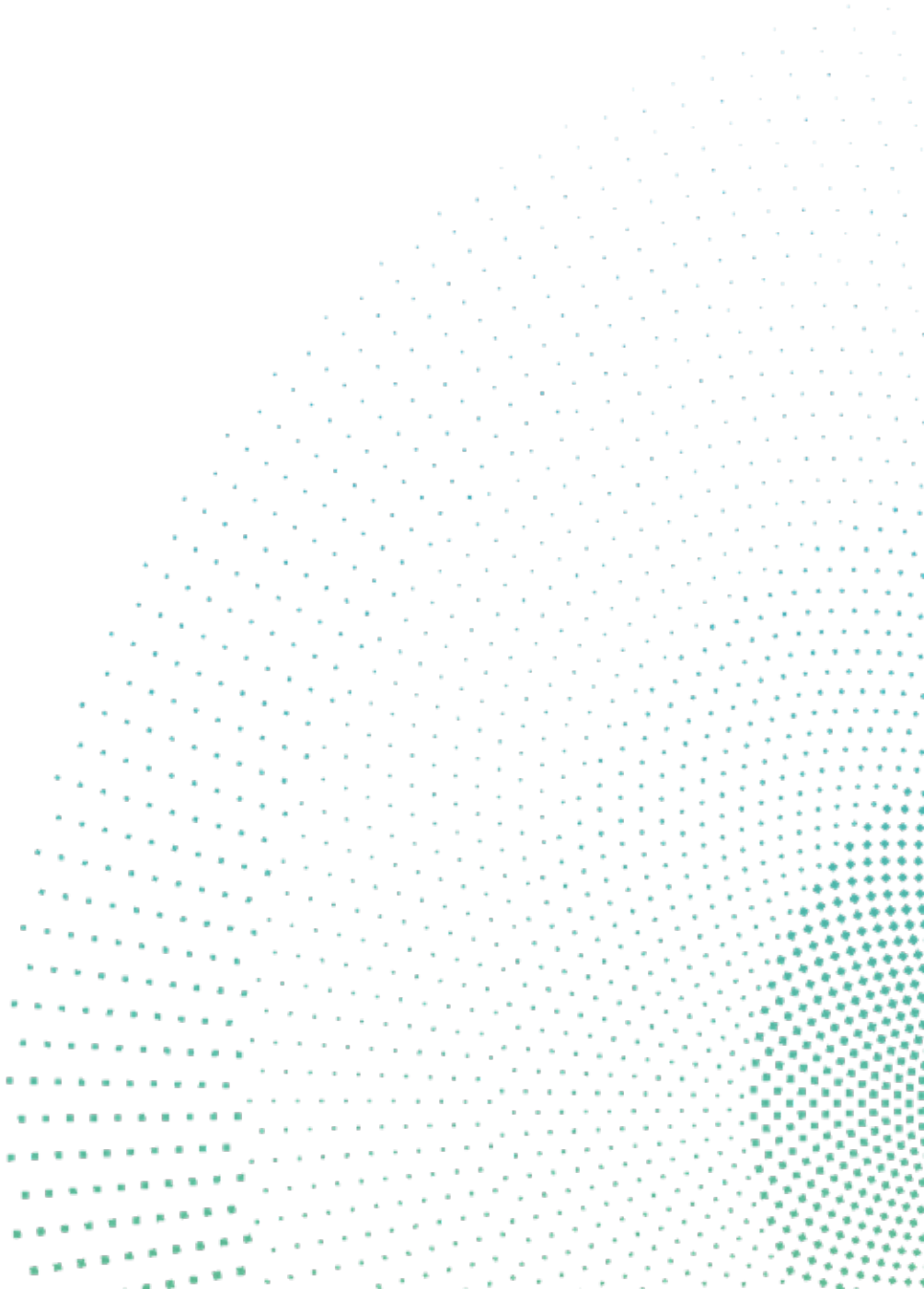
It would likely be worth the effort to work on these ethical challenges because of the opportunities presented by digital doppelgangers. As organizations are focused on Environment, Social, and Governance (ESG) strategies, digital doppelgangers could make work more sustainable by scaling expertise in a way that improves worker well-being and promotes healthy organizational growth. Below, we highlight some specific areas where digital doppelgangers have the potential to improve work for enterprises as well as workers.

Enterprise benefits: Most organizations are facing difficult talent and growth challenges while dealing with internal and external pressures to move faster, do more, and become more efficient – often all at the same time. Digital doppelgangers offer a new mechanism to rise above these competing forces. They can help to address a variety of talent-related challenges by scaling the expertise and presence of individuals and teams across the enterprise and retaining institutional knowledge.

Having the ability to proliferate critical skills across the organization via digital doppelgangers can radically change how talent management is viewed. Instead of recruiting or developing talent based on workload or demand forecasts, organizations could strategically search to add new skills, capabilities, experiences, and perspectives to differentiate their blended human + machine workforce as a competitive advantage. Pairing human workers and teams with digital doppelgangers can also unlock new levels of productivity, speed, and efficiency while reducing worker burnout, creating a flywheel effect to drive exponential performance improvement across the organization.

There are also opportunities to commercialize digital doppelgangers to create new business lines. Digital doppelgangers could be deployed as intellectual property sold or leased to other organizations lacking specific skills and expertise. In a challenging global talent market, this represents a new approach to create a human capital advantage.

Worker benefits: Digital doppelgangers can provide workers with a new, personalized, and highly capable form of on-the-job assistance. Because digital doppelgangers will learn directly from their human counterparts in addition to large data sets, the collaboration between people and machines should greatly improve. As a result, workers are expected to be able to elevate the human experience by entrusting digital doppelgangers to complete a variety of activities on their behalf, allowing people to refocus their time on the energizing aspects of their job. As digital doppelgangers take on more work from their human counterparts, they will likely not only learn and improve from doing this work but be able to share these lessons with their human counterparts. In other words, learning between humans and digital doppelgangers could become bidirectional over time.



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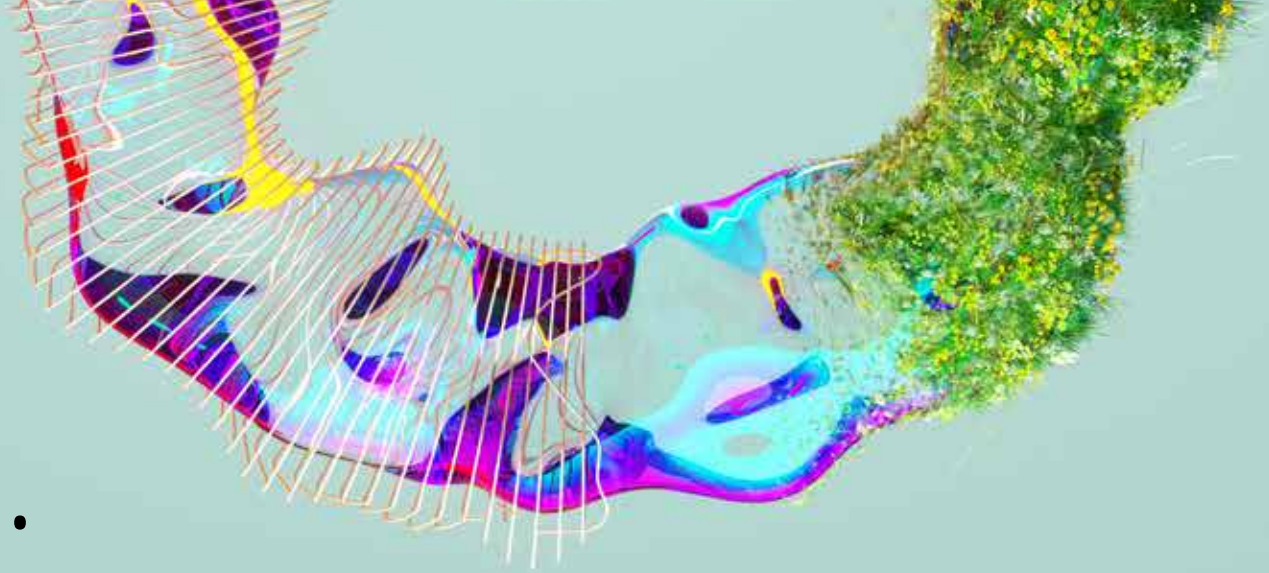

A future scenario: A CLO expands her capacity

Heather is the chief legal officer of a company that is expanding into five new countries. As part of her role, Heather must produce a new global legal charter for the company as well as five country-specific versions. She is hoping her new digital doppelganger can make the work of developing the new charters more manageable.

To develop a framework for the new charters, Heather creates the global version while her digital doppelganger observes. The digital doppelganger then combines this training with country-specific legal information and input from local legal teams to draft the country-specific charters for Heather to review.

Heather and her digital doppelganger work in parallel during the normal workday. When the human Heather finishes for the day—or the weekend—the digital version carries on independently – responding to emails and prioritizing meetings on the calendar. Heather's work-life balance is better, and so is her income: Although her employer built the digital doppelganger, Heather receives ongoing royalties as the identity owner.

Working together, Heather and her digital doppelganger cut the time to create the new charters in half. As the project is winding down, Heather's thoughts turn to taking a long-overdue holiday. In the old days, this would have been impossible between the expansion project and her day-to-day activities as in-house counsel. But Heather keeps her vacation plans, leaving her laptop at home. She knows her digital doppelganger will hold down the fort while she's away.

Building the next generation of digital workers

Building the next generation of digital workers

Digital doppelgangers offer a pathway to accelerate organizational growth, innovation, and sustainability while improving the day-to-day experience of workers. While there are similarities between digital doppelgangers and today's AI, it is important to understand these four key takeaways when developing a long-term strategy to integrate digital doppelgangers into your workforce.

- Traditionally, organizations have focused on using AI to take on discrete tasks and use cases. Digital doppelgangers **represent a shift in how AI is applied** because they are designed to replicate unique qualities and capabilities of individuals and teams. This distinction may sound subtle, but it represents a significant change for how humans should evaluate using AI in the workplace. Thinking about AI as a tool to replicate unique human traits should involve making a significant investment in shifting mindsets and organizational culture.
- In contrast to today's AI which relies exclusively on big data and technical programming for input, **digital doppelgangers should be trained by working with humans in smaller, contextually relevant settings.** This can create new low-code and no-code ways for non-technical workers to develop and deploy AI. While this would empower individual human workers, it would also create new kinds of risks for organizations to monitor and mitigate.
- While digital doppelgangers are designed to replicate human attributes, they should not be seen as a replacement for humans. Instead, digital doppelgangers represent a new opportunity to **improve human and machine collaboration**. Viewing digital doppelgangers through this lens can create opportunities for blended workforces capable of doing more than humans or machines could do alone.
- Because of the above differences, **digital doppelgangers are expected to pose different kinds of potential benefits as well as ethical challenges** when compared with today's applications of AI. There is a lot to figure out as the digital doppelganger idea comes to fruition.

Deloitte's 5th annual Age of With™ study indicates 94% of surveyed business leaders agree that AI is important to success over the next 5 years and 76% of surveyed organizations are expecting to increase investments in AI in the next fiscal year[14]. These kinds of investments can help bring digital doppelgangers from concept to workplace collaborator in the coming years. The organizations that get ahead of the curve, invest early, experiment, and strive to harness the full potential of AI will have the opportunity to create significant business and human capital advantages.

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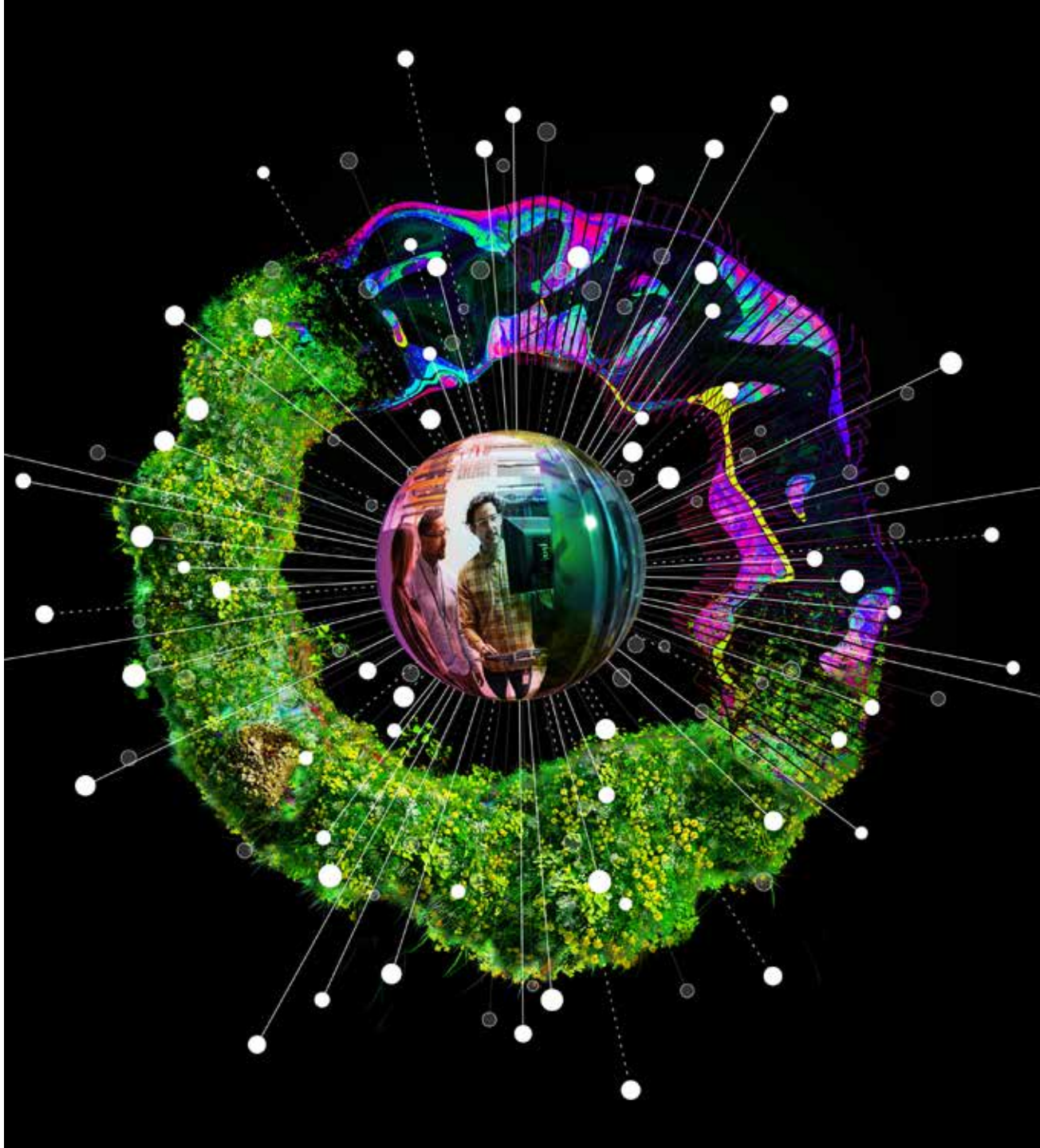

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