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AI as an Employee

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Corporate executives and academics agree that emerging artificial intelligence (AI) capabilities will usher in significant changes in how enterprises operate. A recent report by International Data Corp suggests that global investment in AI systems is expected to double over the next four years.¹ Meanwhile, other recent surveys indicate that integrating their capabilities into organizations will create perplexing new questions.² Given the unique characteristics of AI systems, such as self-learning capacities and superior analytical “thinking,” we argue that application and management of AI in organizations requires a new management mindset. This mindset may require treating AI as an “employee,” based on the ideal of human-AI symbiosis and an aspiration to elevate humans in knowledge work.

What’s new?

The basis for organizations to effectively leverage AI by treating it as an employee comes from the deep learning technology driving much of the current AI interest. Deep learning, as differ-

¹ IDC. (2020). *Worldwide Spending on Artificial Intelligence Is Expected to Double in Four Years*, Reaching \$110 Billion in 2024. <https://www.idc.com/getdoc.jsp?containerId=prUS46794720>

² McKinsey & Company. (2019). *Global AI Survey: AI proves its worth, but few scale impact*. <https://www.mckinsey.com/featured-insights/artificial-intelligence/global-ai-survey-ai-proves-its-worth-but-few-scale-impact>

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entiated from classic machine learning, has its roots in mathematical modeling powered by neural networks. Deep learning capabilities are informed by human capabilities such as vision,

speech and language comprehension. For example, human vision is the inspiration for deep learning models that can understand the content of an image or video. This capability is a core component of self-driving cars, for example. In another example, language comprehension is a deep learning model

capability widely used in speech-to-text generation, language translation and natural language generation. Deep learning will continue to extend its capabilities inspired by human cognitive knowledge and sensory perception capabilities. The power of AI (i.e., deep learning) is in the latent knowledge that deep learning models self-generate. A deep learning model does not need a human engineer to tell it what to pay attention to. Latent knowledge gives the model the ability to learn the important features of what it’s analyzing, along with how important those features are in the context of the problem or situation to which it’s being applied. The more a deep learning solution is “trained” (i.e., used), the “smarter” it becomes.

New AI algorithms are making inroads into the cognitive and intellectual tasks underlying knowledge work. A solution can combine several deep learning (AI) capabilities to provide a human-like performance of a knowledge task. For example, when a caption is needed for a photo accompanying a news article, a solution may combine a deep learning model that understands images with a deep learning text generation model and automatically generate a caption for the photo.

Given such technological breakthroughs, some pundits might argue that AI-powered technologies will gradually take the place of human knowledge workers.³ Indeed, the number of knowledge-worker tasks that AI systems will be able to execute will continue to rise, at the same proficiency level or better than as currently performed by human knowledge workers. However, such a perspective dismisses the potential for AI-powered capabilities to take over certain activities from knowledge workers with the goal of establishing a partnership between worker and intelligent agent, thereby elevating the contribution of knowledge workers to higher-level analysis — in what we might call “the rise of the humans.”

AI as an employee

The current pervasive mindset considers AI a technology to be used for specific, discrete activities. This approach certainly has merit. At a minimum, it not only provides some tangible return on the company's investment in the AI solution, but also enables them to gain experience in the field of AI without a fuller commitment. Historically, information technology has not been viewed as the same type of resource as, say, human capital. Instead, it has generally been viewed as a depreciation asset for the company. As such, current frameworks treat AI and human workers as two inherently different actors in organizations, and often capture the AI effects on HR and other organizational processes as an exogenous actor.⁴ In this article, we treat the two symmetrically and direct attention to “artificial capital.” As intelligent agents increasingly contribute to intellectual and cognitive tasks, we advocate treating them in a way similar to how we treat knowledge workers, viewing them as equal members of an organization's teams and collective intelligence — what Tom Malone recently dubbed human-computer “superminds.”⁵

Here, we take an anthropomorphic perspective toward the

³ Shell, E. R. (2018). *AI and Automation Will Replace Most Human Workers Because They Don't Have to Be Perfect—Just Better Than You*. Newsweek. <https://www.newsweek.com/2018/11/30/ai-and-automation-will-replace-most-human-workers-because-they-dont-have-be-1225552.html>

⁴ Duggan, J., Sherman, U., Carbery, R., & McDonnell, A. (2020). Algorithmic management and app-work in the gig economy: A research agenda for employment relations and HRM. In *Human Resource Management Journal* (Vol. 30, Issue 1, pp. 114–132). <https://doi.org/10.1111/1748-8583.12258>

⁵ Malone, T. W. (2018). How human-computer ‘Superminds’ are redefining the future of work. *MIT Sloan Management Review*, 59(4), 34–41.

affordances of AI in organizations. Given that AI solutions, as outlined above, are inspired by uniquely human characteristics and have been shown by emerging research to leverage already known human knowledge, organizations would benefit by realizing that AI solutions can actually be an accretive asset to their business. This requires a shift in perspective to recognize AI machines' capacity for continued “learning” from human capabilities (speech, vision, language understanding and reasoning). Rather than characterizing AI as a technology that “automates things” and “displaces workers,” it is more advantageous to consider it an employee with the ability to learn, grow within the company, interact as a member of the team and enable other workers — just like a human employee.

The AI-as-an-employee framework

Building on the human resources lifecycle as a basic framework of management of human capital,⁶ we discuss how AI can be managed as an employee. This new perspective can be understood as key steps involved in managing “artificial capital.” It is important to note that the HR lifecycle framework does not provide a direct translation to an AI-as-an-employee framework. Rather, it should serve as an inspiration for understanding how a framework of the latter might be developed.

Implications of the AI-as-an-employee perspective

Treating AI as an employee may require new strategies and plans. Here are a few implications that could guide organizations in implementing this perspective.

Emphasizing partnership rather than full automation

Lessons from past technology implementations have made it clear that using technology to replace workers demoralizes the workforce (even those that do not lose their job). AI-as-an-employee should not be used for wholesale displacement of workers, but instead implemented to help organizations and managers to augment employees' work and develop a new type of partnership between AI and knowledge workers. An AI-as-an-employee perspective calls for a top-down approach by company leadership to set the culture. It is critical to educate

⁶ Cappelli, P., Tambe, P., & Yakubovich, V. (2019). Artificial Intelligence in Human Resources Management: Challenges and a Path Forward. *California Management Review*, 61(4), 15–42.

Table 1: Artificial Capital (AC) Life Cycle

AC operations	Examples of questions to address
Recruiting - Identifying possible sources for AI capability	Are we sourcing AI suppliers or developing the technology in house with the appropriate capabilities?
Selection	<p>What type of AI system do we choose?</p> <p>Do the selected AI systems fit the culture of the organization? Do they reinforce workers' upskilling?</p> <p>What type of "background check" of the system is needed?</p>
Onboarding - AI strategy framework that defines the progression of AI use	What AI adoption framework exists to assess the effectiveness of the new AI employee?
Training	<p>What is the continuous training framework for the ongoing improved intelligence of the AI employee?</p> <p>How can mutual learning be reinforced (i.e., human employees learning from AI and vice versa)?</p>
Performance management - Identifying good and bad performance	<p>Do we have a framework to calibrate the "cognitive performance" of the AI employee?</p> <p>How can we develop frameworks to audit and manage bias and trust? Are our AI employees ethical?</p> <p>How can we benchmark ourselves against our competitors' use of AI?</p>
Advancement - Expanding the decision responsibility of the AI employee	<p>How do we transfer the learning done by our AI employee to other problem areas or adjacent domains of the business?</p> <p>How can we enable our AI systems to transcend specific functional areas and connect the dots across domains?</p>
Retention	<p>How can we increase the versatility of our AI systems so that they can serve longer and integrate more effectively with our organizational processes?</p> <p>How can we develop frameworks to enable the AI employee to enrich the human workers' jobs and thereby improve retention?</p>
Employee benefits	How can we use AI-as-an-employee as a recognized benefit to our human employees (e.g., How can AI contribute to workers' upskilling or reskilling?)?

both managers and employees that the new AI employee is not there to take their jobs, but to enrich their roles. In this way, AI becomes part of the culture and fabric of the company.

AI as a partner and teammate

As Table 1 indicates, mutual learning is a central aspect of this partnership. The first step in a true partnership is to recognize AI as another value-added member of the team. Human partners need to make the effort to learn from the artificial partner and, in turn, help it learn and grow. Strategically, AI-powered machines will be able to interact with humans using capabilities inspired by human competencies such as listening, speech, vision, intonation and other naturalistic modes of interaction and learning.

In this way, AI can facilitate both individual-level knowledge activities and teamwork. “Personal intelligent assistants” can serve as partners for individual workers, while other AI systems can facilitate team interactions and take on team member tasks (e.g., serve as a team memory or help onboard new AI or human employees). Finally, deep learning systems can help generate new knowledge in teams, and connect variables previously overlooked by their human partners.

Managing “artificial capital”

Pervasive management paradigms in a knowledge-intensive organization have been concerned with the management of human capital. An AI-as-an-employee perspective supplements this focus and directs attention to the effective management of artificial capital and its synergy with human and social capital within and across organizations. Considering AI systems as traditional IT systems, in which they are frequently viewed as depreciation assets, trivializes the unique capacities of such intelligent systems to generate latent knowledge as an accretive asset. The latent knowledge couched in the AI system is retained in the organization, and is likely to continue to grow as AI systems grow smarter.

Finally, as noted, an interesting prospect of AI-as-an-employee is the ability of artificial and human capital to help advance one another. For example, IBM research developed a “debate system” that can debate a human on selected subjects. Such competition between human and AI employees can help nurture the intellectual capabilities of both.

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