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AI Should Augment Human Intelligence, Not Replace It

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Summary.   Will smart machines really replace human workers? Probably not. People and AI both bring different abilities and strengths to the table. The real question is: how can human intelligence work with artificial intelligence to produce augmented intelligence. Chess... **more**

In an economy where data is changing how companies create value — and compete — experts predict that using artificial intelligence (AI) at a larger scale will add as much as $15.7 trillion to the global economy

by 2030. As AI is changing how companies work, many believe that who does this work will change, too — and that organizations will begin to replace human employees with intelligent machines. This is already happening: intelligent systems are displacing humans in manufacturing, service delivery, recruitment, and the financial industry, consequently moving human workers towards lower-paid jobs or making them unemployed. This trend has led some to conclude that in 2040 our workforce may be totally unrecognizable.

Are humans and machine really in competition with each other though? The history of work — particularly since the Industrial Revolution — is the history of people outsourcing their labor to machines. While that began with rote, repetitive physical tasks like weaving, machines have evolved to the point where they can now do what we might think of as complex cognitive work, such as math equations, recognizing language and speech, and writing. Machines thus seem ready to replicate the work of our minds, and not just our bodies. In the 21st century, AI is evolving to be superior to humans in many tasks, which makes that we seem ready to outsource our intelligence to technology. With this latest trend, it seems like there's nothing that can't soon be automated, meaning that no job is safe from being offloaded to machines.

This vision of the future of work has taken the shape of a zero-sum game, in which there can only be one winner.

We believe, however, that this view of the role AI will play in the workplace is wrong. The question of whether AI will replace human workers assumes that AI and humans have the same qualities and abilities — but, in reality, they don't. AI-based machines are fast, more accurate, and consistently rational, but they aren't intuitive, emotional, or culturally sensitive. And, it's exactly these abilities that humans posses and which make us effective.

Machine Intelligence vs. Human Intelligence

In general, people recognize today's advanced computers as intelligent because they have the potential to learn and make decisions based on the information they take in. But while we may recognize that ability, it's a decidedly different type of intelligence what we posses.

In its simplest form, AI is a computer acting and deciding in ways that seem intelligent. In line with Alan Turing's philosophy, AI imitates how humans act, feel, speak, and decide. This type of intelligence is extremely useful in an organizational setting: Because of its imitating abilities, AI has the quality to identify informational patterns that optimize trends relevant to the job. In addition, contrary to humans, AI never gets physically tired and as long it's fed data it will keep going.

These qualities mean that AI is perfectly suited to put at work in lower-level routine tasks that are repetitive and take place within a closed management system. In such a system, the rules of the game are clear and not influenced by external forces. Think, for example, of an assembly line where workers are not interrupted by external demands and influences like work meetings. As a case in point, the assembly line is exactly the place where Amazon placed algorithms in the role of managers to supervise human workers and even fire them. As the work is repetitive and subject to rigid procedures optimizing efficiency and productivity, AI is able to perform in more accurate ways to human supervisors.

Human abilities, however, are more expansive. Contrary to AI abilities that are only responsive to the data available, humans have the ability to imagine, anticipate, feel, and judge changing situations, which allows them to shift from short-term to long-term concerns. These abilities are unique to humans and do not require a steady flow of externally provided data to work as is the case with artificial intelligence.

In this way humans represent what we call authentic intelligence — a different type of AI, if you will. This type of intelligence is needed when open systems are in place. In an open management system, the team or organization is interacting with the external environment and therefore has to deal with influences from outside. Such work setting requires the ability to anticipate and work with, for example, sudden changes and distorted information exchange, while at the same time being creative in distilling a vision and future strategy. In open systems, transformation efforts are continuously at work and effective management of that process requires authentic intelligence.

Although Artificial Intelligence (referred to as AI1 here) seems opposite to Authentic Intelligence (referred to as AI2 here), they are also complimentary. In the context of organizations, both types of intelligence offer a range of specific talents.

Which talents – operationalized as abilities needed to meet performance requirements – are needed to perform best? It is, first of all, important to emphasize that talent can win games, but often it will not win championships — teams win championships. For this reason, we believe that it will be the combination of the talents included in both AI1 and AI2, working in tandem, that will make for the future of intelligent work. It will create the kind of intelligence that will allow for organizations to be more efficient and accurate, but at the same time also creative and pro-active. This other type of AI we call Augmented Intelligence (referred to as AI3 here).

The Third Type of AI: Augmented Intelligence

What will AI3 be able to offer that AI1 and AI2 can't? The second author of this article has some unique insight here: he is known for winning championships, while at the same time he also has the distinctive experience of being the first human to lose a high-level game to a machine. In 1997, chess grand master Garry Kasparov lost a game from an IBM supercomputer program called Deep Blue. It left him to rethink how the intellectual game of chess could be

approached differently, not simply as an individual effort but as a collaborative one. And, with the unexpected victory of Deep Blue, he decided to try collaborating with an AI.

In a match in 1998 in León, Spain, Kasparov partnered with a PC running the chess software of his choice — an arrangement called "advanced chess" — in a match against the Bulgarian Veselin Topalov, who he had beaten 4-0 a month earlier. This time, with both players supported by computers, the match ended in a 3-3 draw. It appeared that the use of a PC nullified the calculative and strategic advances Kasparov usually displayed over his opponent.

The match provided an important illustration of how humans might work with AI. After the match, Kasparov noted that the use of a PC allowed him to focus more on strategic planning while machine took care of the calculations. Nevertheless, he also stressed that simply putting together the best human player and best PC did not, in his eyes, reveal games that were perfect. Like with human teams, the power of working with an AI comes from how the person and computer compliment each other; the best players and most powerful AIs partnering up don't necessarily produce the best results.

Once again, the chess world offers a useful test case for how this collaboration can play out. In 2005 the online chess playing site Playchess.com hosted what it called a "freestyle" chess tournament in which anyone could compete in teams with other players or computers. What made this competition interesting is that several groups of grandmasters working with computers also participated in this tournament. Predictably, most people expected that one of these grandmasters in combination with a supercomputer would dominate this competition — but that's not what happened. The tournament was won by a pair of amateur American chess players using three computers. It was their ability to coordinate and coach effectively their computers that defeated the combination of a smart grandmaster and a PC with great computational power.

This surprising result underscores an important lesson: the process of how players and computers interact determines how efficient the partnership will be. Or, as Kasparov expressed it, "Weak human + machine + better process was superior to a strong computer alone and, more remarkably, superior to a strong human + machine + inferior process."

Recommendations

The enhancing and collaborative potential that we envision stands in stark contrast to the zero-sum predictions of what AI will do to our society and organizations. Instead, we believe that greater productivity and the automation of cognitively routine work is a boon, not a threat. After all, new technology always has disruptive effects early on in the implementation and development phases and usually reveals its real value only after some time.

This reality, however, does not mean that we have to wait patiently until when this value eventually reveals itself — very much the opposite! Our principal challenge as business people is to anticipate what artificial intelligence means in relationship to how humans think and act, and work to integrate the new technologies ambitiously and strategically into our organizations. We can't just passively wait for it to overtake traditional methods. So, what is it that we can then do at this moment to ensure integration of the different AI's to make our organizations work effectively?

First, teams will gradually become composed of humans and non-humans working together, which we refer to as the "new diversity." The psychology of the new diversity will bring with it the risk that stereotypical beliefs and biases can easily influence decisions and team work. Machine as a non-human co-worker may be met with distrust and negative expectations as any other out-group member and as such encourage humans to share less information and avoid working with machine. Team leaders will need to be apt to respond to such negative team dynamics and trained in ways that they understand the reality of those negative beliefs and its consequences.

Second, the new shape of teams will call for leaders who are skilled in bringing different parties together. In the future, creating inclusive teams by aligning man and machine will be an important ability to be trained and developed. As the earlier mentioned examples show, to achieve better performance by employing these new diversity teams, a main requirement for leaders will be to transform themselves in being masters of coordinating and coaching team processes.

Third, team processes will need to be managed effectively and this will have to be done by a human. For humans to align the strengths and weaknesses of man and machine, they will need to be educated to understand how AI works, what it can be used for and decide — by means of the judgment abilities of their authentic intelligence — how it can be used best to foster performance serving human interests.

Augmented intelligence, as the third type of AI, is the step forward to the future of intelligent work. The future of work is a concept used to indicate the growth of employees and their performance in more efficient ways. The debate on this topic, however, has become quite ambiguous in its intentions. Specifically, because of cost-cutting strategies narratives, businesses today are in a stage where machines are often introduced as the new super employee that may leave humans ultimately in an inferior role to serve machine. An essential element of a truly intelligent type of future of work, however, means that we do expand the workforce where both humans and machine will be part of, but with the aim to improve humanity and well-being while also being more efficient in the execution of our jobs. So, augmented intelligence is indeed collaborative in nature, but it's also clear that it represents a collaborative effort in service of humans.

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Garry Kasparov is the chairman of the Human Rights Foundation and founder of the Renew Democracy Initiative. He writes and speaks frequently on politics, decision-making, and human-machine collaboration. Kasparov became the youngest world chess champion in history at 22 in 1985 and retained the top rating in the world for 20 years. His famous matches against the IBM super-computer Deep Blue in 1996 and 1997 were key to bringing artificial intelligence, and chess, into the mainstream. His latest book on artificial intelligence and the future of human-plus-machine is *Deep Thinking: Where Machine Intelligence Ends and Human Creativity Begins* (2017).