

A Conversation with Manoj Saxena

Artificial Intelligence Will Dramatically Affect Businesses

Manoj Saxena, executive chairman of CognitiveScale and a founding managing director of The Entrepreneurs' Fund IV, serves on the board of the Saxena Family Foundation and AI Global, a nonprofit dedicated to promoting artificial intelligence. He was the first general manager of IBM Watson, a pioneering machine-learning effort, and recently retired after six years on the board of the San Antonio Branch of the Federal Reserve Bank of Dallas.

Q. You directed the Watson project at IBM. In what way do you see Watson as the father of Artificial Intelligence?

The creation of Watson is a seminal moment that brought artificial intelligence (AI) into the mainstream. Data is the new oil, and AI is the refinery that processes data into useful products. AI has been around about 75 years, and Watson emerged when cloud-computing costs were dropping, large amounts of data were being generated and businesses were searching for the next level of productivity growth, a competitive edge and a comparative advantage beyond the internet.

I gained four central insights while working on Watson. The first is that we are now at a dawn of a new class of computing that will transform us as a society and species. Whereas the industrial revolution amplified the power of our arms and legs via steam engines, AI will amplify the power of our brain. Every tool built since the dawn of human society has been inferior to our brain, and AI is the first that is equal to or superior.

The second is that the idea of human versus machine is incorrect. Instead, think of it as human and machine. The last big innovation of IBM was Deep Blue, the first computerized chess player

that outcompeted the human brain in terms of calculations. Something very interesting happened after Deep Blue. Over the next 15 years, the average age of a chess grandmaster decreased by over 10 years as humans began to use the machine not as an opponent, but as a coach. Thus, the real power of AI is not about replacing what we do, but augmenting it.

Third, for AI to succeed, it needs to be applied deep into an industry or business process. A computer learns by understanding domain and context, both of which exist deep in an industry. Therefore, AI must be utilized vertically within an industry.

Lastly, AI is completely different than any machine previously built. Every machine created in information technology during the previous 75 years was built on the rules of "if-then-else" programming. An AI system self-learns from patterns and inferences while improving its knowledge exponentially.

Q. Many experts expect that AI will dramatically affect U.S. business over the next five years. How so?

In simple terms, it's embrace or be extinguished. Whether it's documents, images, words, speech or videos, AI is an

intelligent computer program that perceives and understands all types of information, infers important signals from such data and continuously learns from its actions. It's going to be woven into every business application and system. It already surrounds us—how we watch movies on Netflix, the way you talk to Alexa, how you vacuum with Roomba, how you drive a car with lane detection and adaptive cruise control.

The notion of AI becoming a silver thread that runs across every application and system will be real. Furthermore, the rate of technological disruption will accelerate due to the amalgamation of an intelligent system with exponential learning capacity and today's digital media platform with exponential distribution. Seventy-five years passed before television reached 50 million users; Angry Birds [video game] achieved that within 30 days and Pokémon Go [mobile game] within 14 days.

Broadly speaking, AI will impact all facets of society. It'll influence how a business remains competitive and gains a competitive edge, how and whom it hires and where it invests. Overall, I believe there will be a significant shift in the workforce skills profile. AI will replace tasks, not jobs. Indeed, AI is the new frontier of economic and technological leadership for the U.S.

Is the U.S. playing a lead role in AI development? I wish my answer were yes, but when I look across the horizon, that's not the case. There is a real danger of the United States losing its competitive edge to China, where the government has put significant resources into AI investment and strategy.

A notable factor that can greatly affect American progress in AI is the current immigration sentiment. The potential to lose future foreign talent in academia and research institutes will play a central role in determining our position as a leader in AI development.

Q. What jobs and industries will be most affected?

There's no doubt AI will massively change the face of employment and industry. AI will primarily function as



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intellectually enhanced aids to individuals in their fields—for example, offering a comprehensive compendium of medical records to doctors and nurses to assist in diagnosis and treatments.

There will be a new class of employment opportunities for individuals who design and maintain the AI robots and systems. We previously saw such a transition during the emergence of the auto industry and entire new sets of jobs—assembly-line workers who built autos, safety inspectors, warranty and service agents, and car wash employees.

Q. During the 20th century, we saw technology initially affect agriculture and then manufacturing. Is AI creating a productivity growth wave in the service sector?

AI will certainly affect service sectors. Jobs such as concierges, fashion models, baseball umpires, mechanical drafters, credit authorizers and brokerage clerks will be dislocated and, in many cases, replaced. Ultimately, AI will support individuals in making better decisions. The essence of AI is to efficiently and effectively operationalize knowledge and, as a result, costs will decrease. Investment in infrastructure will grow and, subsequently, so will wages. That’s the essential promise of AI: to use data to make better decisions while getting smarter and more efficient.

Q. Stagnant productivity growth has perplexed economists in recent decades. Are we still waiting to feel AI’s impact?

Adding AI tools does not immediately translate to increasing productivity.

If you had given an individual a free car in 1915—when there was little knowledge of driving or maintaining vehicles—there would have been improvement in neither commerce nor productivity. AI is currently in that same early stage.

Q. How would you advise a young person to prepare for the workforce of the next 30 years?

There are four suggestions. The first is to learn multiple disciplines. What used to be referred to as STEM is now STEAM—science, technology, engineering, arts and math. The notion of combining technology and humanities is crucial. Steve Jobs showed us that beautiful products can result from it.

The second is to treat and view your career not as a ladder but as a jungle gym. Being willing to go sideways and accept jobs in different areas will advance your career faster.

Third is to learn and build strong digital abilities.

Finally, develop skills that machines find hard to imitate. Creativity, empathy, emotional intelligence and teamwork are all skills of the human mind, requiring context switching and processing, and these are what machines find most difficult to replicate.

Q. Given the expected future impact of AI, how would you advise Texas’ political and business leaders?

There are five dimensions to consider. The first is education. Educate yourself on the complexities of AI and then educate the next generation by engaging different educational institutions to build

the next generation of cognitive skills and expertise.

The second is regulations. We need to implement regulations around ownership and usage of data as a basic human right. As of now, data theft and exploitation are concerns as pivotal as the risk of AI machines and systems being hacked.

The third is access. As a nation, there exists a necessity to ensure AI tools are accessible across all social classes and regions. Modern society as we know it already recognizes the rich as becoming richer and the poor becoming poorer. Thus, if the issue of access is not properly addressed, the gap between the haves and have-nots will only be exacerbated.

The next suggestion is fostering academic and industry partnership and collaboration.

Fifth, and the most worrying to me, is to prevent AI from being weaponized. A similar phenomenon exists today through the weaponization of social media vis-à-vis fake advertisements. There are AI robots that create fake ads on the fly to target individuals based on their social media activity. If applied to drones, bombs or lasers, it would present great social concerns comparable in scale to nuclear weaponry.