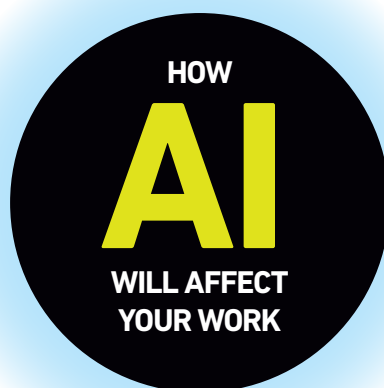




**AIN'T**  
**IT GRAND?**



BY ROB ROQUE AND ANDREW SOSWA

**A**rtificial Intelligence (AI) has been around for decades as another name for automation. It has aided the medical industry, the vehicle industry, and aviation industry, just to name a few. Largely based on complex algorithms, the technology was usually piloted by those in science and academics and used in their research. This evolved into the Internet of Things (IoT), which showed most of the world how AI can be used in the common household and workplace. The advent of technologies such as ChatGPT has brought on a new generation of AI tools that have enabled non-programmers to harness the technology and open opportunities never thought of before.

This article presents a condensed history of AI and how it has evolved into the everyday practices of our society. After an overview of how AI works, we will suggest ways in which it can be leveraged in local government and highlight governments that are exploring this realm. We'll also address tough questions like, "Will I lose my job to AI?" Finally, we will conclude with policy implications.

### A BRIEF HISTORY

Whether you like it or not, AI is everywhere. How does your social media feed know to include vacation posts?

AI. How do popular shopping sites know what enticing products to present? That's right—AI. And did you assume that a human was on the other end of the keyboard last time you used a chat tool at your bank or ticket consolidator site? It was probably AI, until it got stuck and typed back, "Hold on. I must get my supervisor."

For more than a millennium, humans have been dreaming up ways to automate human tasks. Since at least 1 BCE, humans have reflected on how human tasks could be automated.<sup>1</sup> A few centuries back, Leonardo DaVinci and others proposed machines to calculate data. Ada Lovelace is considered the world's first computer programmer because she wrote an algorithm to program Charles Babbage's Analytical Engine in the 1840s.

In the 1930s, Alan Turing asked the question, "Can machines think?" He developed a thought experiment in which an interrogator sought answers from two participants, a human and a computer. The participants were only allowed to type their answers to hide the thinking machine in "artificial flesh." The interrogator asked a series of questions and tried to determine whether the response came from a human or a "thinking machine." Turing posed questions that can easily be handled today by OpenAI's ChatGPT. For example, Turing prepared several illustration

questions such as, "Please write me a sonnet on the subject of the Forth Bridge" (which he assumed future AI would demure—as most humans would).<sup>2</sup> The modern application of this challenge is known as the "Turing Test" (and ChatGPT was able to churn one out just fine).<sup>3</sup>

John McCarthy, a mathematics professor at Dartmouth College, is credited with creating the term "artificial intelligence." AI as a field was born at a conference he facilitated (along with Marvin Minsky, Claude Shannon, and Nathaniel Rochester) for leading computer scientists. The vision established at the Dartmouth Conference was "that computers can be made to perform intelligent tasks."<sup>4</sup> Although the conference failed to establish a common approach, participants went home and started forming AI trajectories under a common vision.

AI has taken various paths since the Dartmouth Conference. Most are based on models that are based on psychological or logistic algorithms. Although it's too technical and lengthy to address in this article, psychological methods focus on human reason or behavior (think shopping recommendations), while logistic methods are used more for processes such as language translation and work processing. But either method can be used interchangeably. In short, there is no agreed-upon approach to AI—but one truth universally acknowledged is that AI relies on data—lots of it.

The evolution of AI since Dartmouth can be represented by a series of tiers<sup>5</sup> described below:

**LEVEL 1: Reactive machines.** Provide predetermined responses based on specific input and cannot recognize patterns or past experiences.

**LEVEL 2: Limited memory.** AI begins to store memory and apply experience to responses to user input.

**LEVEL 3: Theory of mind.** AI gains social intelligence, enabling it to personalize responses to user inquiries.

**LEVEL 4: Self-awareness.** AI has self-awareness. Its responses can be adjusted based on the limitations it recognizes due to its perceived environment.

**LEVEL 5: Automation.** AI machines begin self-learning without user direction.

**LEVEL 6: Large language models.** AI uses natural language and neural networks (imitating the human brain) to consume large amounts of data, learn from it, and summarize for user inquiries. This level is commonly known as generative AI, or “text to X.”

Underlying the AI technologies are the large sets of data, mostly commercialized (for example, Amazon, Google, IBM, and Microsoft), and the data is collected instantaneously from your electronic footprint. [More about this later.]

The way AI works (in short) is by “training” itself from a set of data (such as, text, data, and pictures) to formulate patterns and predictions.<sup>6</sup> The machine uses an algorithm to provide an answer based on one of the following functions: descriptive (uses input data to explain what happened); predictive (uses input data to explain what could happen); or prescriptive (uses input data to recommend actions to take). The quality of the data input affects the quality of the results/output. If the source data is biased or stale, the results will also probably reflect bias or be out of date. ChatGPT, for instance, is based on data through September 2021. OpenAI, the owners of ChatGPT, decided to baseline their data set through September 2021 to improve their algorithms. Interacting with ChatGPT will therefore yield results based on two-year-old data.

## THE BENEFITS OF AI

It is a misnomer that AI is ChatGPT. It is more than that. AI is actually an entire field of technology, and ChatGPT is a conglomeration of multiple AI disciplines. When viewed from this perspective, it's easier to understand that AI technology can be used for purposes other than chatbots. The following are examples of how AI is being used in the public sector.

**State of Massachusetts.** The state uses chat functions to allow internal users to interact with some business systems using natural language. The government is also using chat to field queries from its public-facing website. In both cases, the state controls the chat function and recognizes that more can be done with AI, which it may explore in the future.<sup>7</sup>

**City of Surrey, British Columbia.** The city offers its citizens an app based on IBM Watson to field public inquiries. Residents can use the MySurrey app to submit queries using natural language and receive answers that are more informative than scraping the internet.<sup>8</sup>

**Spokane Public Schools, Washington.** The district uses AI to help teachers improve their classroom practices. Teachers upload videos of their classroom instruction, answer a series of questions, and an AI coach works alongside them to adjust their curriculum and teaching style. The process is purely voluntary and is in its infancy.<sup>9</sup>

**City of Columbus, Ohio.** The city has implemented several technology platforms based on AI, which it highlighted at GFOA's 2023 annual conference. Columbus uses AI to generate form letters, conduct data analysis, and assist with audits.

**U.S. Census Bureau.** U.S. Census chat users can make inquiries using natural language. Data is only available for a few elements such as demographics and crime, but additional data will be available in the future.

Intentional use of AI by the public sector in the U.S. and Canada is still in its infancy. It's being used in other parts of the world to monitor commuters and other transactions, although these are mostly in countries where personal

information is not heavily regulated. Unintentional use of AI happens all of the time, however, since most public sector data is in the public domain. Public domain data is used, particularly by the private sector, to build data to train their own AI applications.

Although AI still isn't prevalent in the public sector, most people in the industry recognize that it is a rapidly evolving and expanding field of increased productivity. Local governments are beginning to experiment with ways in which AI can augment their operations, particularly when it is difficult to hire new employees. Other institutions are learning, through AI methods, why they need to collect data for AI purposes. For example, the founders of Recidiviz worked with prison systems to collect and consolidate data so AI would be able to identify prisoners who were eligible for release from prison or parole. In the past, some inmates and parolees had been held past their release eligibility dates because the prisons didn't have enough data.<sup>10</sup> AI tools were used to identify individuals who had been incarcerated beyond their sentencing guidelines.

## HOW WILL AI AFFECT MY JOB?

Most people fear that AI will replace their jobs—and that includes the current AI technologists responsible for programming AI. It is predicted that more than 80 percent of the workforce will be affected by AI technologies. In part, the concern is warranted. A study commissioned by the World Economic Forum suggests that AI will affect up to 40 percent of the world's working hours. [These are the jobs most likely to be lost—and created—because of AI.]<sup>11</sup> Recent studies suggest that AI will replace certain employees, but they also suggest that AI will open up opportunities for displaced workers. In short, the studies theorize that the success of future workers will be defined by how well individuals can adapt and leverage AI in the future.

Nonetheless, nearly all AI experts agree that AI won't replace human beings or human workers in the foreseeable future. Instead, they foresee a whole new workforce specializing in AI-infused processes. They also believe that AI will create net new growth in jobs. One of



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these, for example, is the job of “prompt engineer,” who is responsible for asking AI the right questions to elicit the best response. Gone are the days where an employee’s job safety could be based on hoarding information. The future is more likely to embrace individuals who can use AI to augment their duties.

### WHAT ARE THE RISKS?

General use of AI tools should be approached with caution at this stage. Users should be fully aware that the current generation of AI is based on the quality of the data sources. The potential for introducing biased data, fake data, and even harmful data into the environments that are used to train AI tools is a real concern. As a result of one famous study, IBM stopped developing facial recognition software. A combination of biased data and subsequent algorithms led to AI computers misclassifying gender based on darker complexions.<sup>12</sup> The study stressed the need for more representative datasets and the reporting of algorithmic performance (as in, no more black box calculations).

Those who fail to learn from history are doomed to repeat it. Big Tech leaders are already calling for some form of regulation before AI truly morphs into an autonomous machine. In an open letter to the world, Elon Musk, Steve Wozniak,

Yuval Noah Harari, and others called on AI developers to pause progress for six months to allow regulatory agencies to catch up.<sup>13</sup> Their concerns are not only rooted in the issues we face now because of the mishandling of social media, but also how AI will be used in the future and the need for transparency. This is popularly known as “establishing the AI guardrails.”

Local governments that implement AI will need to consider many factors. For example, if a government is providing information through a chatbot, and the bot provides authoritative but incorrect information, who is liable if the answer results in harm? Policies will need to be developed to test AI and to ensure that the data local government AI tools are training on is reliable, safe, and unbiased. And government agencies are already working on it; the National Institute of Standards and Technology (NIST)—which is a part of the U.S. Department of Commerce—is working on guidelines for minimizing bias in AI.<sup>14</sup>

### CONCLUSION

We are in an exciting evolution of AI technology, and where it will take us is anybody’s guess. Who knew, for example, that networked computers developed at the U.S. Department of Defense would lead to Internet commerce? No doubt, there

will be changes in the workforce because of AI—but local governments shouldn’t be hampered by the notion that jobs could be lost. Instead, they should focus on how services can be improved by using AI. Those who are willing to explore the potential uses of AI should proceed with some caution, however, and recognize the shortcomings of AI training data and potential flaws in the AI algorithms. The Internet has created some problems, but it has also created many benefits. The same should be expected from AI.

And in the words of ChatGPT (May 3, 2023 version) itself, “AI has the potential to improve efficiency, accuracy, and decision-making in various industries, leading to advancements in healthcare, education, transportation, and more.”<sup>15</sup>

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<sup>1</sup> Dario Guarascio, Lucrezia Fanti, and Massimo Moggi, “From Heron of Alexandria to Amazon’s Alexa: a stylized history of AI and its impact on business models, organization and work,” *Economia e Politica Industriale*, August 2022.

<sup>2</sup> Alan Turing, “Computing Machinery and Intelligence,” *Mind*, 1950.

<sup>3</sup> Seth Perlow, “AI is better at writing poems than you’d expect. But that’s fine,” *Washington Post*, February 13, 2023.

<sup>4</sup> James Moor, “The Dartmouth College Artificial Intelligence Conference: The Next Fifty Years,” *AI Magazine*, 2006.

<sup>5</sup> Andrew Soswa, “AI as a Source of Truth: How Reliable is AI Information?” *ResearchGate*, May 2023 (researchgate.net).

<sup>6</sup> Machine learning can be supervised (requiring humans to label data) or unsupervised (the machine learns from unstructured or unlabeled data), or it can be achieved through reinforcement (award-based analysis such as game theory). See: Sara Brown, “Machine learning, explained,” MIT Management-Sloan School, April 21, 2021 (mitsloan.mit.edu).

<sup>7</sup> Lauren Harrison and Noelle Knell, “Massachusetts Dabbles in Generative AI: ‘ChatGPT With Controls,’” *Government Technology*, May 12, 2023 (govtech.com).

<sup>8</sup> Surrey Uses AI to Deliver Services to Its Residents, University of Canada West, 2022 (ucanwest.ca).

<sup>9</sup> Lauraine Langreo, Can AI Conduct Teacher Evaluations in Schools? *Government Technology*, May 15, 2023 (govtech.com).

<sup>10</sup> Clementine Jacoby, The Future of Corrections is Data-Informed, *Correctional News*, December 8, 2022 (correctionalnews.com).

<sup>11</sup> These are the jobs most likely to be lost—and created—because of AI, *World Economic Forum*, May 4, 2023 (weforum.org).

<sup>12</sup> Joy Buolamwini and Timnit Gebru, “Gender Shades: Intersectional Accuracy Disparities in Commercial Gender Classification,” presented at Conference on Fairness, Accountability, and Transparency: Proceedings of Machine Learning Research 81:1–15, 2018.

<sup>13</sup> Daniel Van Boon, Elon Musk Is Right: We Need to Regulate AI Now, *CNET*, May 17, 2023 (cnet.com).

<sup>14</sup> Reva Schwartz, Apostol Vassilev, Kristen Greene, Lori Perine, Andrew Burt, Patrick Hall, “Toward a Standard for Identifying and Managing Bias in Artificial Intelligence,” *National Institute of Standards and Technology-U.S. Department of Commerce*, 2022.