Assessment #1: Industry Trends & Future Outlook Assessment

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Assessment #1 - Current State of the Machine Learning Industry

Works Cited

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What's Happening Right Now?

The current state of the machine learning industry is one that prioritizes money over results. In 2025, AI investments reached a new high of $581 billion, a more than double increase from the $253 billion invested in 2024. Approximately $344 billion of that was for American companies (Smith). Since 2022, the computing power behind AI has been tripling every year, making it about 30 times more powerful than in 2021 (Smith). The models are also progressing

rapidly. AI accuracy climbed from 8.8 percent in 2025 to 50 percent or higher by April 2026 on a test that asks expert-level questions about a wide range of subjects, called Humanity's Last Exam (Smith).

Agents is the number one word people in this field keep repeating this year. An agent is a system that can be used to plan and execute a multi-step task without needing to be asked one question at a time. According to a McKinsey survey released in August 2026, 44 percent of businesses now use AI throughout the organization, compared to 38 percent a year ago. In the large company group ($1 billion+ in annual revenue), 40 percent are increasing agents, versus 27 percent a year ago. Small businesses have yet to shift, and remain at 22 percent (Tinkoff et al.). One of the primary points being discussed is that disparity between big and small companies.

What's Disrupting the Field?

It's not a new technology, really. It is the disconnect between the usefulness of AI to the individual worker and the lack of visibility of the same in the company's profits. In the same McKinsey survey, 80 percent of people reported that AI has made them personally more productive, while only 37 percent of companies could cite any benefit to their earnings as a result of AI. This 37 percent is the same as in 2025 (Tinkoff et al.). Cost is beginning to become an issue as well. The cost of using AI, including the cost of per tokens, is now hindering the use of AI for about one in five companies (Tinkoff et al.). Whether a model can do a job or not was the question for years. But the question remains, is it worth the price?

The big question is whether all this spending is warranted. So far, the predicted job losses have not been realized. While 32 percent of companies predicted they would eliminate jobs due to AI a year ago, only 14 percent actually did so. Nevertheless, 39 percent believe that they will experience reductions in the coming year (Tinkoff et al.). Then there is the environmental price

that is often mentioned. The estimated carbon-equivalent emissions from training xAI's Grok 4 model were 72,000 tons, and some independent estimates were as high as 140,000 tons (Smith).

Old Ways vs. New Ways

Ten years ago, constructing a machine learning system required gathering your own labeled data set for a specific task, manually selecting features that were useful for the model, and training a model from scratch. The research questions were primarily related to the design of the models. Nowadays, most teams begin with a large model already trained from another team and make fine adjustments to it. The models almost entirely come from companies, rather than universities. More than 90 percent of the major model releases come from industry, and the United States alone produced 50 notable models in 2025 (Smith).

The hard part is no longer the model, due to that change. It's trying to find out if the model is really working and re-engineering the job to fit it. 6 percent of companies are considered AI high performers, which means they can attribute 5 percent or more of their earnings to AI. The difference with those companies is that they design their entire process around the model rather than incorporating AI into an existing process (Tinkoff et al.). What is common now, and wasn't three years ago, are tools for assessing models, incorporating external data and monitoring costs.

Looking Ahead & Keeping Your Research Fresh

I believe that in the next 2-5 years, the extent to which companies use AI will depend more on cost than ability; and that companies will narrow down to the jobs where agents actually work in production, rather than running experiments everywhere. The job numbers point the same way. According to the Bureau of Labor Statistics, the number of data scientist careers will increase by 82,500, or 33.5 percent, from 2024 to 2034. Information security analysts will see a

28.5 percent increase and software developers 15.8 percent, but developers will still account for the most jobs, at over 267,000. In the meantime, customer service representatives, legal secretaries, procurement clerks, and medical transcriptionists are all expected to contract ("Artificial Intelligence"). The job market is not going away, it's splitting in two.

This has changed my thinking about research. Initially, I was thinking about what these models can do. Reading this, I wonder why the value doesn't appear even though the ability definitely does. That puts me on the path of testing and deployment of AI, not building it. It also left me with questions that I can't answer right now. So what do the 6 percent of high performers do differently day to day? As costs increase, will companies head back to smaller models for a single job? And does a jump on a benchmark such as Humanity's Last Exam actually foretell anything about real work? These are the three things that I want to explore next.