How AI Adoption is Shaping the Future of Jobs: Insights from My System Dynamics Model

Introduction:

Artificial Intelligence (AI) has been at the center of the tech revolution, driving advancements across industries and raising crucial questions about the future of work. I've always been intrigued by how AI transforms the world, especially in terms of job creation and displacement. So, I set out to explore this dynamic relationship using a combination of **predictive analysis** in Python and a **system dynamics model** built in AnyLogic.

In this blog, I will share my findings on AI adoption rates and their impact on the job market, as well as a peek into the modeling process that helped me predict these outcomes. I'll walk you through my methodology and results to provide a clear picture of what AI's rapid growth could mean for the workforce.

Section 1: How I Got Started

The data for this project came from my interest in understanding both the **positive** and **negative** impacts AI adoption can have on the job market. I began by gathering publicly available data, including:

- **AI Adoption Rate (%)**: The percentage of businesses adopting AI between 2018 and 2025.
- **AI Software Revenue (in billions)**: The financial growth of AI technologies.
- **Jobs Eliminated by AI (millions)**: The predicted number of jobs AI could displace.
- **Jobs Created by AI (millions)**: The opportunities AI could generate in new industries.

This project allowed me to combine two of my favorite areas—data analysis and system modeling—to see how AI's rise correlates with shifts in employment patterns. It also gave me a chance to predict what could happen beyond the available data for the years 2025 and 2026.

Section 2: Key Findings from My Analysis

1. AI Adoption Growth Predictions

Using Python's linear regression model, I projected AI adoption rates for 2025 and 2026 based on historical data. Here's what I found:

- **Predicted AI Adoption Rate for 2025**: **53.75%**
- **Predicted AI Adoption Rate for 2026**: **59.54%**

AI adoption is expected to accelerate over the next two years. As businesses invest more in AI-driven technologies, we'll see the percentage of businesses using AI continue to climb toward 60%.

2. AI Software Revenue Predictions

The financial impact of AI is massive. Based on current trends, here's where AI software revenue could be heading:

- **Predicted AI Software Revenue for 2025**: **$110.25 billion**
- **Predicted AI Software Revenue for 2026**: **$126.57 billion**

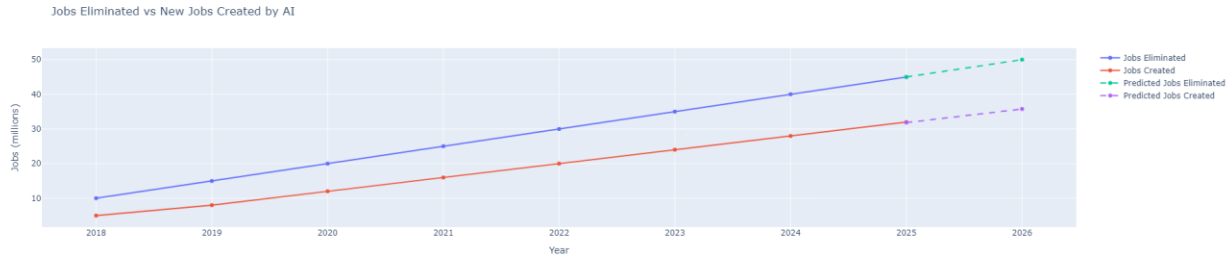
This highlights just how lucrative the AI space will be, as businesses rush to adopt AI to gain a competitive edge.

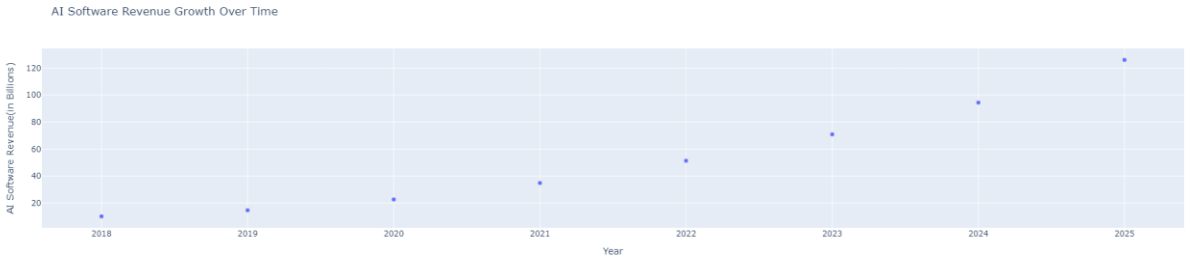
3. Impact on Jobs: Jobs Created vs. Jobs Eliminated

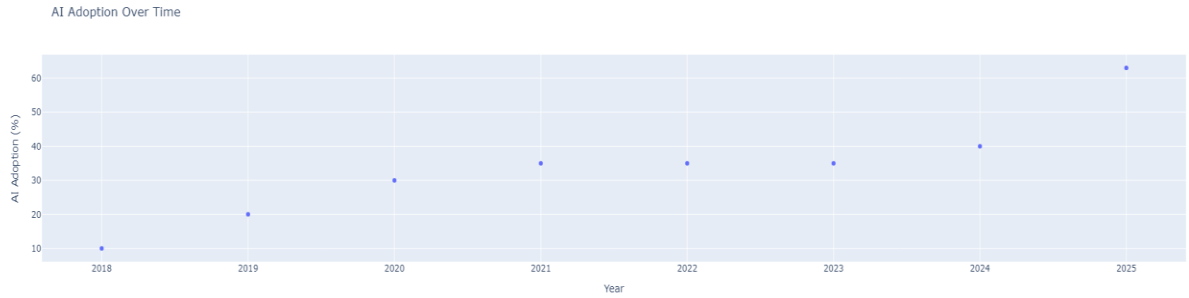
AI adoption will not only impact technology investments but also the workforce. Based on my model, here are the predictions:

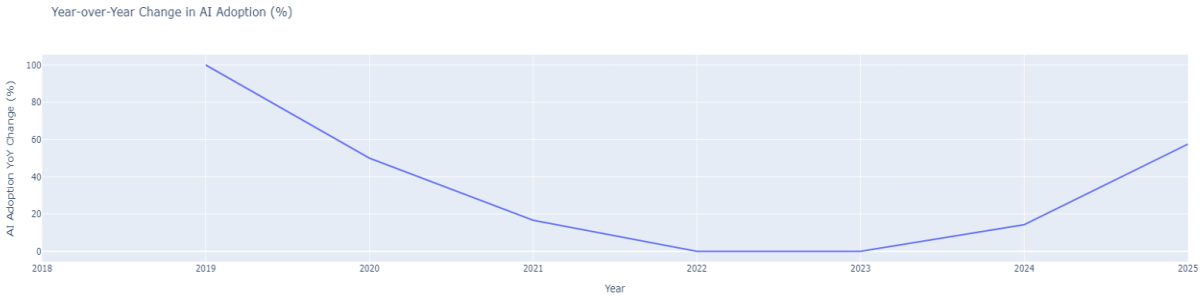
- **Predicted Jobs Eliminated in 2025**: **45 million**
- **Predicted Jobs Created in 2025**: **31.83 million**
- **Predicted Jobs Eliminated in 2026**: **50 million**
- **Predicted Jobs Created in 2026**: **35.75 million**

The model suggests that while AI will eliminate millions of jobs, especially in roles heavily reliant on automation, it will also create many new opportunities. These new roles will likely be in areas related to AI development, ethics, data management, and advanced tech support.









Section 3: Understanding the Relationship Between AI Adoption and Job Impact

I was particularly interested in understanding how tightly connected AI adoption is to changes in the job market. Here's what I discovered:

- **Correlation between AI Adoption and Jobs Eliminated**: **0.92**
- **Correlation between AI Adoption and Jobs Created**: **0.91**

The strong correlation between AI adoption and job elimination suggests that as AI technology becomes more prevalent, many current roles may be displaced. On the flip side, there's almost an equally strong correlation between AI adoption and job creation, pointing to a future where new, more specialized roles emerge as AI transforms industries.

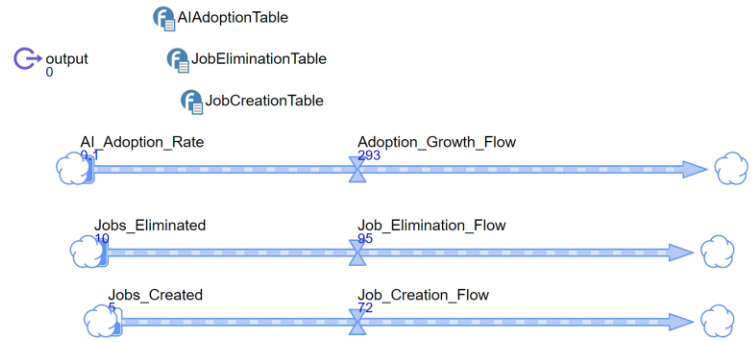
This finding reinforced my belief that while AI will disrupt the job market, it will also bring new opportunities, especially for those willing to upskill or pivot to AI-related fields.

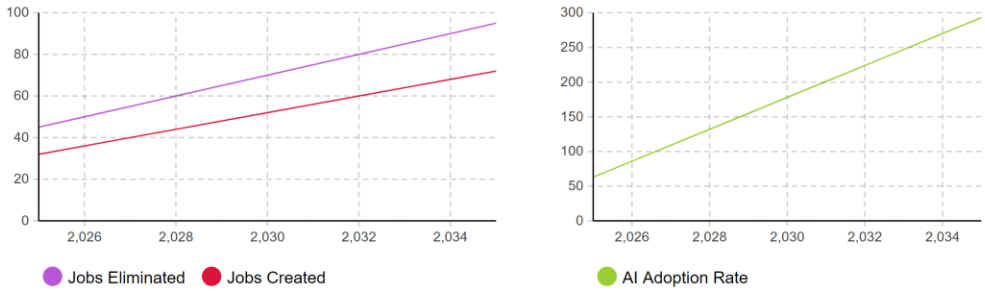
Section 4: Modeling the Impact: My Approach in AnyLogic

I've always been fascinated by dynamic systems, and AnyLogic provided the perfect tool to model the ripple effects of AI adoption. Here's how I built the model:

- **AI Adoption Rate as a Driving Force**: I used historical data to establish the adoption rate up to 2025 and built predictive flows for 2026 and beyond.
- **Job Elimination and Creation**: These two factors were modeled as stocks, with flows driven by AI adoption. I added a prediction system to estimate the number of jobs AI would both eliminate and create in the coming years.

Here's a quick visualization of the system dynamics model, which shows the complex interplay between these factors over time:





This model was a great way to tie together the quantitative findings from my Python analysis and visualize how AI adoption could change the employment landscape.

Section 5: Concluding Thoughts: What Does the Future Hold?

Predicting the future is tricky, but my findings indicate that AI's rapid growth will bring both opportunities and challenges. While **50 million jobs may be eliminated** by 2026, **35 million new jobs** could emerge to replace them. This shift will likely require workers to reskill and adapt to new roles, especially in sectors related to AI development and management.

For me, this project has been a valuable learning experience. It was a chance to blend **data analysis** and **system dynamics modeling** to explore one of the most pressing issues of our time. The findings here are just the start, there's still so much more to learn about AI's potential impact on our future workforce.

Section 6: Next Steps in the Journey

As I continue to develop this project, I plan to incorporate additional factors, such as the influence of government policies and global AI regulations, to refine the model further. I'm also eager to explore how different industries will be uniquely affected by AI, from manufacturing to healthcare and beyond.

If you're interested in exploring these findings further, you can check out my full model and code on GitHub. Feel free to reach out if you have any questions or thoughts about the analysis!

Check out the full model and code for this project on my GitHub repository here. I'd love to hear your thoughts and feedback on how we can further explore AI's impact on jobs.