

A modern office interior with a wooden staircase and glass railings. In the background, three framed posters are visible on a wall. The left poster is blue and white with the text 'WEB DEVELOPMENT'. The middle poster is white with a person's photo and the text 'Ernest Smart'. The right poster is yellow and black with the text 'DATA SCIENCE'. The scene is brightly lit with warm tones.

AI Growth & The US Job Market

Bader Muhssin
Brainstation - Data Science

Agenda

- 3 Datasets
- Relationship between AI Adoption and Labour Market Trends

 FEDERAL RESERVE BANK of ST. LOUIS



1. The AI & Employment Question
2. Our Data Sources
3. What We Discovered
4. Implications for Business and Policy
5. Next Steps

The Problem Statement

- Will increased AI adoption lead to higher unemployment?
- Is AI creating or displacing jobs?
- Should we be concerned about technological unemployment?

This analysis examines whether a relationship exists between:

- AI adoption metrics (job postings and project growth)
- US unemployment rates between 2015-2023*

Previous research has shown mixed results:

- MIT: AI tends to transform jobs rather than eliminate them
- McKinsey: Effects vary by industry and skill level

Hypothesis

What I Set Out to Test

Will increasing AI adoption correlate with changes in U.S. unemployment rates?

Approach

- Tracked AI growth through two metrics: project development and job postings
- Analyzed these against unemployment rates over 9 years
- Looked for statistical relationships between these trends

[AI Projects Growth] ----?----> [Unemployment Rate]

|
|
v

[AI Job Postings] ----?----> [Unemployment Rate]

Data and Tools Used



AI Projects Growth
2015-2023



Unemployment Rate
2015-2023



AI Job Postings
2015-2023

Focus on US data to ensure
consistent comparison.

The Ideal Scenario

1. Additional data
 - a. Industry specific UE rates
 - b. Educational attainment status
 - c. Granular time data
(quarterly/monthly)
 - d. Wage data (will people make
less money now?)



Data Processing

1. Data Types
 - a. Ensured all metrics were on the same yearly timeline
2. Missing Values
 - a. Focused exclusively on US employment markets
3. Data Aggregation
 - a. Created combined dataset covering 2015-2023*
4. Data Integration
 - a. Connected all three datasets based on corresponding years



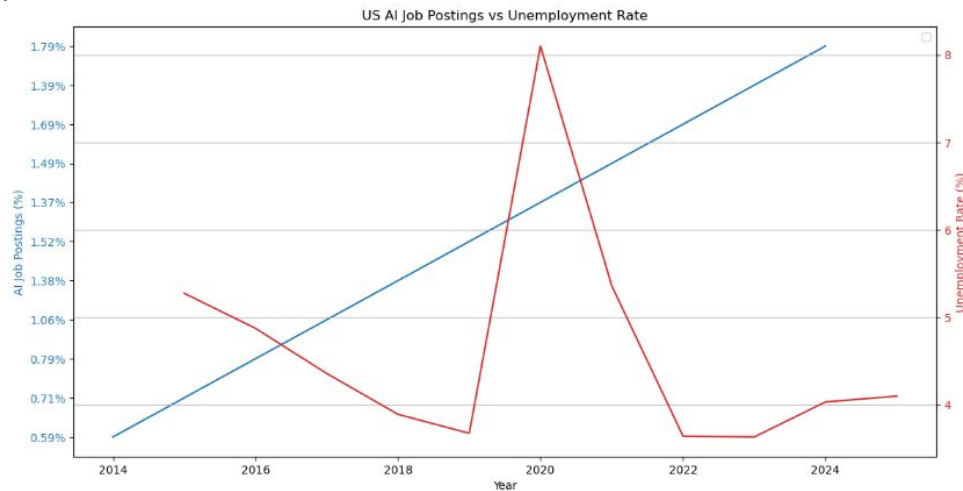
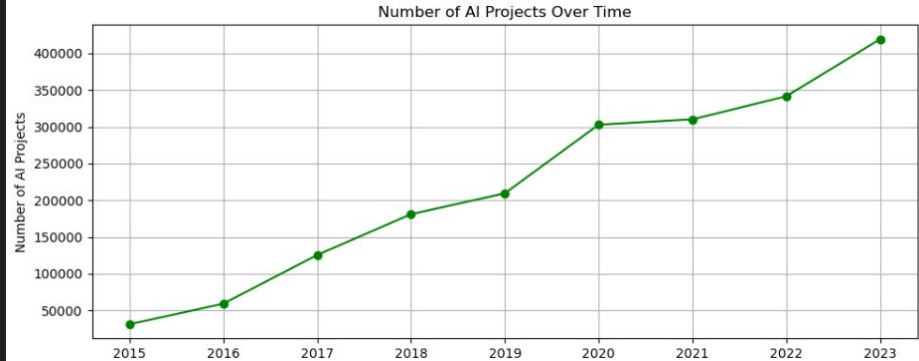
Exploratory Data Analysis

Key Trends Discovered

- AI Projects: Increased ~10x from 2015-2023
- AI Job Postings: Grew from 0.71% to 1.39% of all job listings
- Unemployment: Fluctuated between 3.5-5.7% (except pandemic spike)

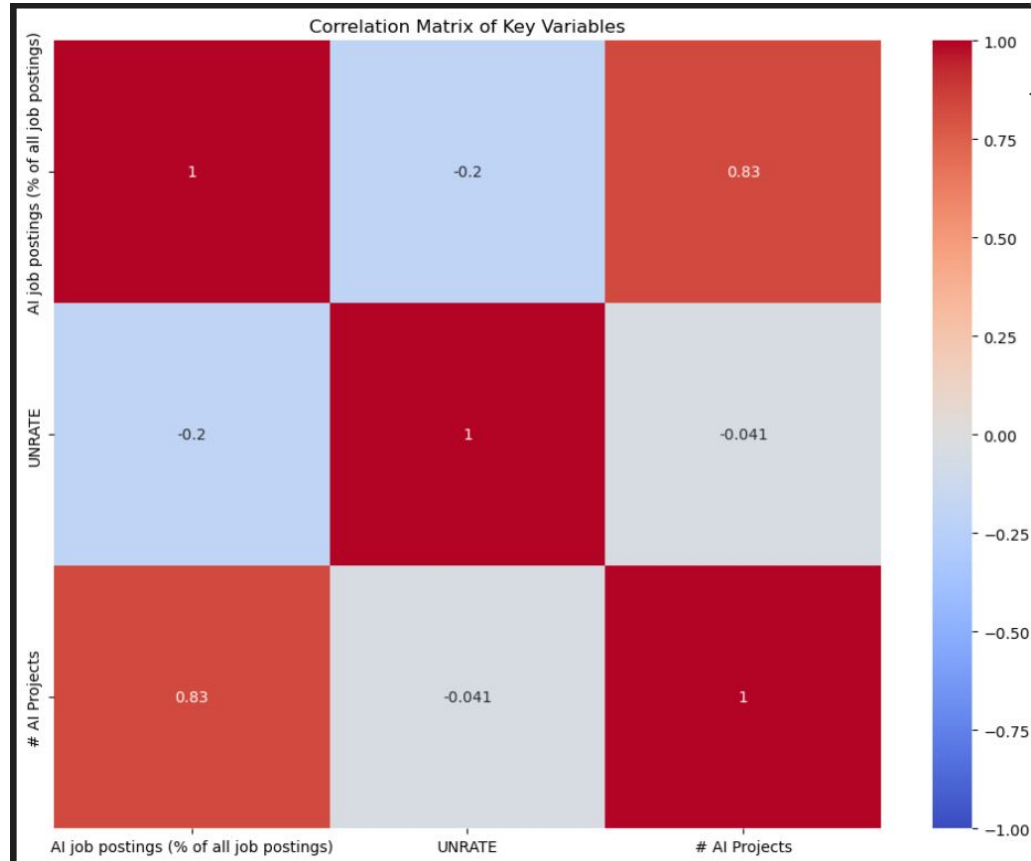
Insights

- 1) AI metrics showed exponential growth while unemployment remained stable.



Relationship Between Key Metrics

Statistical Analysis



- AI Projects & AI Job Postings: Strong positive relationship (0.83)
- AI Metrics & Unemployment: No significant relationship
- 2023 saw slight decrease in AI job postings despite continued project growth

Modeling

What My Analysis Revealed

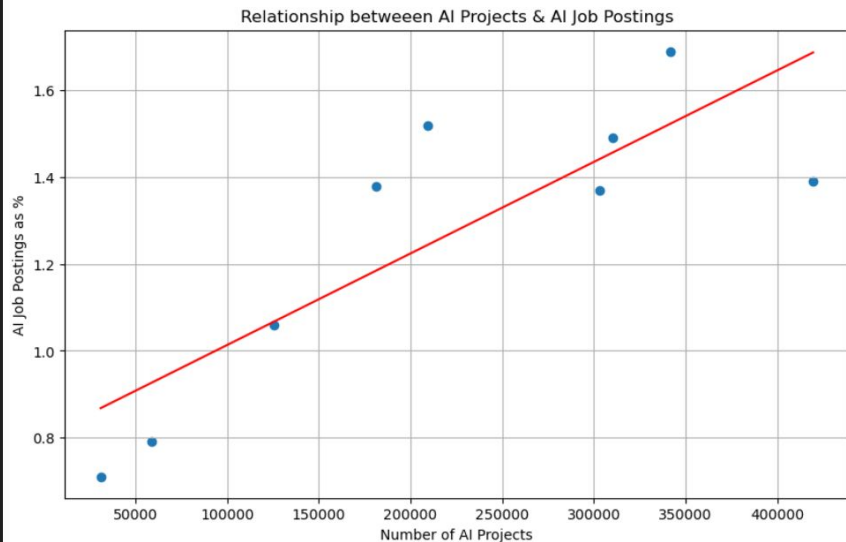
Linear regression performance: {'R2': -0.2922508263575547, 'MAE': 0.603493215377042,}

Initially tested whether AI metrics predict unemployment:

- Result: No meaningful relationship found

Pivoted to examine what drives AI job creation:

- AI Projects strongly predict AI Job Postings
- For every 100,000 new AI projects, AI job postings increase by 0.211%
- 69% of changes in AI job demand can be explained by AI project growth





Summary Conclusions

What I Learned

- ❌ The Hypothesis that AI adoption would correlate with unemployment was not confirmed

- ❌ Despite exponential AI growth, no corresponding impact on overall unemployment was found

- ✓ AI appears to be creating specialized jobs rather than reducing total employment


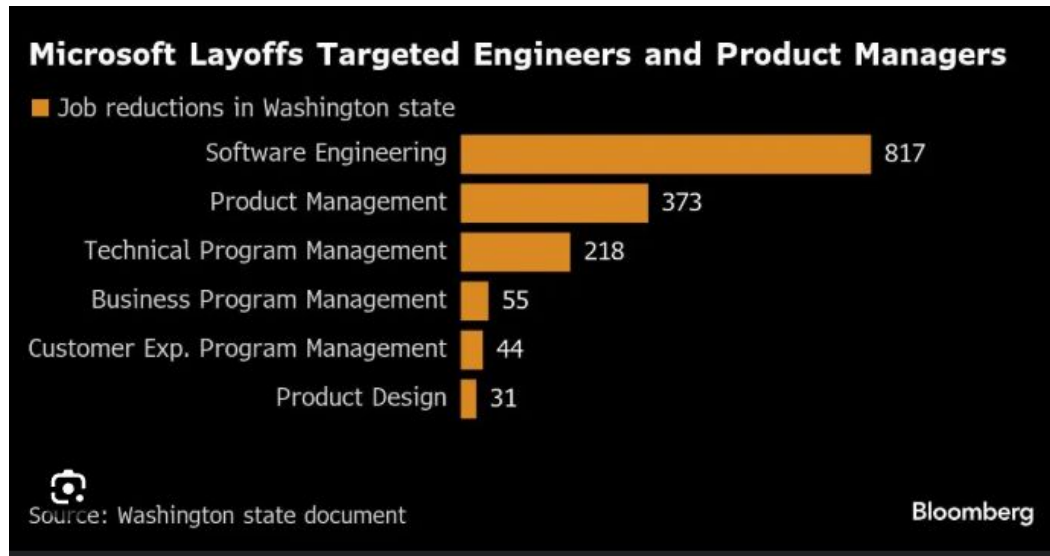
- ✓ Relationship between AI development and AI hiring is strong and positive ($R^2=0.69$) 

Real-world AI Context: 2023

Turning Point

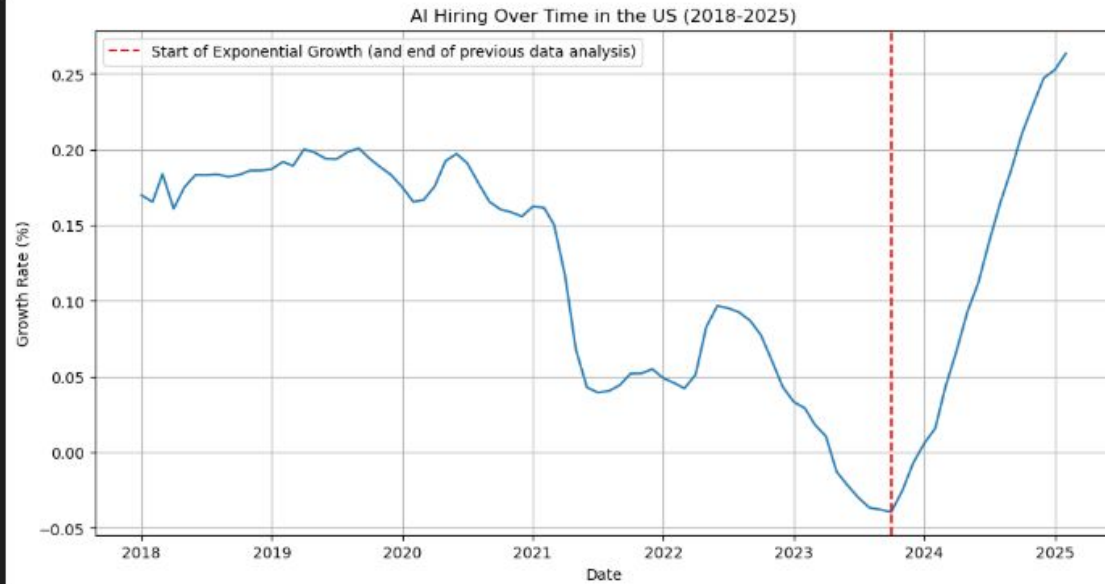
The Inflection Point: Late 2023

- **Enterprise Adoption:** "By late 2023, 55% of enterprises were using generative AI, up from 28% in early 2023" (McKinsey)
- **Model Releases:** "2023 saw the release of 32 major foundation models, more than double the previous year" (Stanford AI Index)
- **Skills Gap:** "AI-related job postings increased 17x faster than software engineering roles in Q4 2023" (LinkedIn)



<https://www.bloomberg.com/news/articles/2025-05-14/microsoft-layoffs-hit-software-engineers-as-industry-touts-ai-savings>

Key Learnings



Average monthly growth rate since 2023: 7.78%

If starting this project again, I would:

- Seek industry-specific unemployment data
- Include wage data to measure quality, not just quantity, of jobs
- Analyze quarterly data for more granular insights or seek heavy duty datasets
- Look at more recent data *



Thank You

Appendix

References

MIT Task Force Research - <https://shorturl.at/w9C1f>

Unemployment Rate - St. Louis Fed - <https://shorturl.at/1o8mS>

AI Index Report - Stanford - <https://shorturl.at/owTNe>

OECD AI (Public AI Projects Dataset) - <https://shorturl.at/eOWkD>

2025 AI Index Report (AI Job Postings Dataset) - <https://shorturl.at/Vb7xs>

OECD AI (AI Hiring Over Time) - <https://tinyurl.com/AIHiringOverTime>

Bloomberg Article - <https://tinyurl.com/3s5p9nrX>

State of AI - McKinsey - <https://tinyurl.com/3c2sfrht>

AI Skills in Job Market - <https://tinyurl.com/2mra69j3> / <https://tinyurl.com/bdex67tk>