CSCI 181 DV Final Project

Impact of AI on Digital Media (2020-2025)

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Background & Motivation

Why This Project?

AI-generated content is rapidly transforming the digital media landscape.

As a CS major, I was concerned by how quickly AI is affecting jobs, trust, and productivity around the world.

Core Motivation:

Understanding this transformation can help inform better decisions in policy, business strategy, and research.

As AI tools become more accessible and powerful, it's important to analyze where and how they are reshaping digital labor.

Project Goal

To build an interactive dashboard that visualizes:

- AI adoption patterns over time and geography
- Economic and societal impacts
- Trust and regulation dynamics
- AI tool usage across industries

Target Users:

- Policymakers → Design informed regulation
- Businesses → Optimize AI strategies
- Researchers → Explore correlations and trends
- Educators or Students→ Use for teaching and learning AI impacts

Dataset Overview

Source

Kaggle:
Impact of AI on Digital Media (2020–2025)

File Size

1 csv file:
15.99 kB
12 columns & 200 rows

Cleanness

Mostly clean but with overlapping entries

Rows

Each row represents a country

Columns

Year
Industry
AI Adoption Rate
Job Loss Rate
Revenue Increase
Consumer Trust
Regulation Status
Top AI Tools Used

Limitations

Covers only the years 2020–2025

Data Processing

- Removed rows with missing key fields (Country, Industry, AI Tool)
- Standardized text formatting (capitalization, whitespace)
- Converted all numeric fields to floats for analysis (AI Adoption Rate, Job Loss, Revenue Increase)
- Aggregated data by Country, Industry, and AI Tool for summary statistics
- Cached cleaned and summarized datasets for fast access

→ Implemented in process_data.py

```
66
67
68
69  def cache_cleaned_data(df, summary_country, summary_industry, summary_tool):
70      """Saves the cleaned and summary data to disk."""
71      df.to_csv(CLEANED_PATH, index=False)
72      summary_country.to_csv(SUMMARY_COUNTRY_PATH, index=False)
73      summary_industry.to_csv(SUMMARY_INDUSTRY_PATH, index=False)
74      summary_tool.to_csv(SUMMARY_TOOL_PATH, index=False)
75      print("Cleaned and aggregated datasets cached.")
76
77
78
```

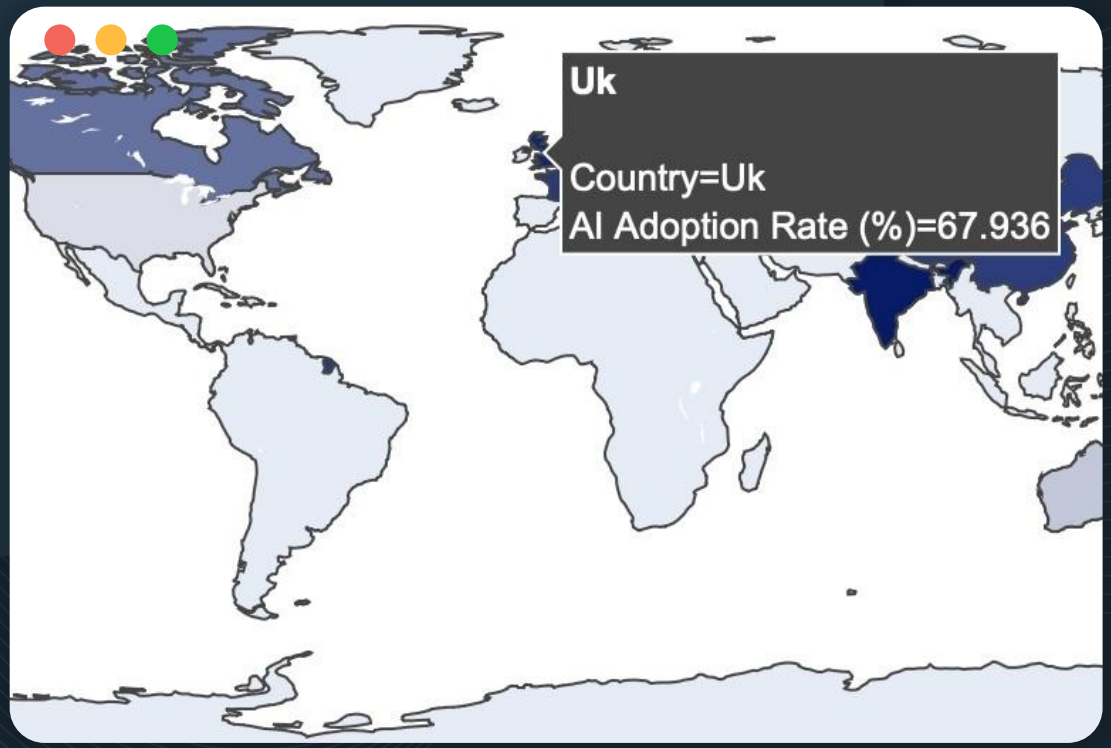
Technical Narrative

- Architecture Overview
  - process_data.py handles data cleaning, aggregation, and caching
  - core.py builds interactive dashboard with tabs and callbacks
  - Uses cached .csv files to optimize performance
  - Each visualization is built separately in its own callback and updates based on user input (like dropdowns or selections)

- Key Technologies
  - Pandas for data loading, cleaning, aggregation, pivoting, and exporting cached results
  - Plotly for creating charts, maps, and networks
  - Dash for structuring the web-based dashboard, UI elements, and callback system

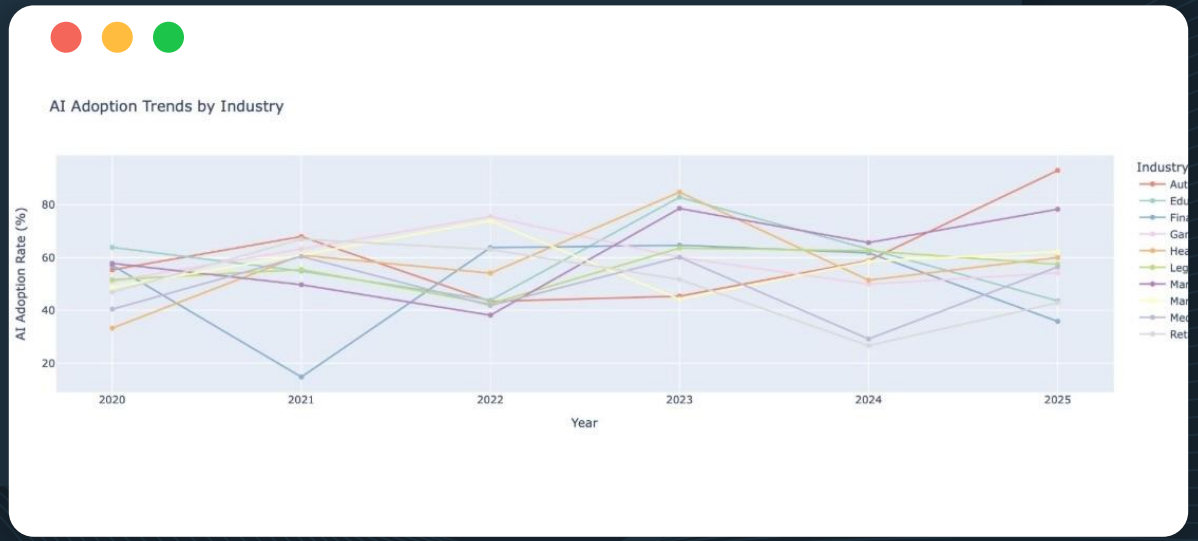
Visualization 1 - Choropleth Map

- AI Adoption Rate / AI Content Volume by Country (2020-2025)
- Slider to switch years
- Toggle for metric
- Tooltip shows % per country
- Hover shows precise % and country
- Animation: AI Growth Over Time



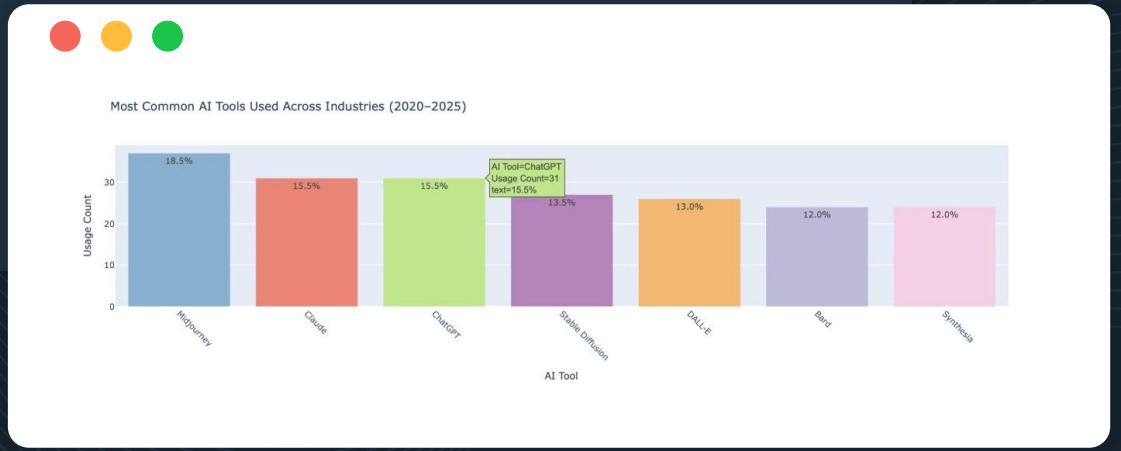
Visualization 2 - Line Chart

- AI Adoption Rate by Industry (2020-2025)
- Multi-select dropdown
- Interactive hover
- Fixed colors per industry



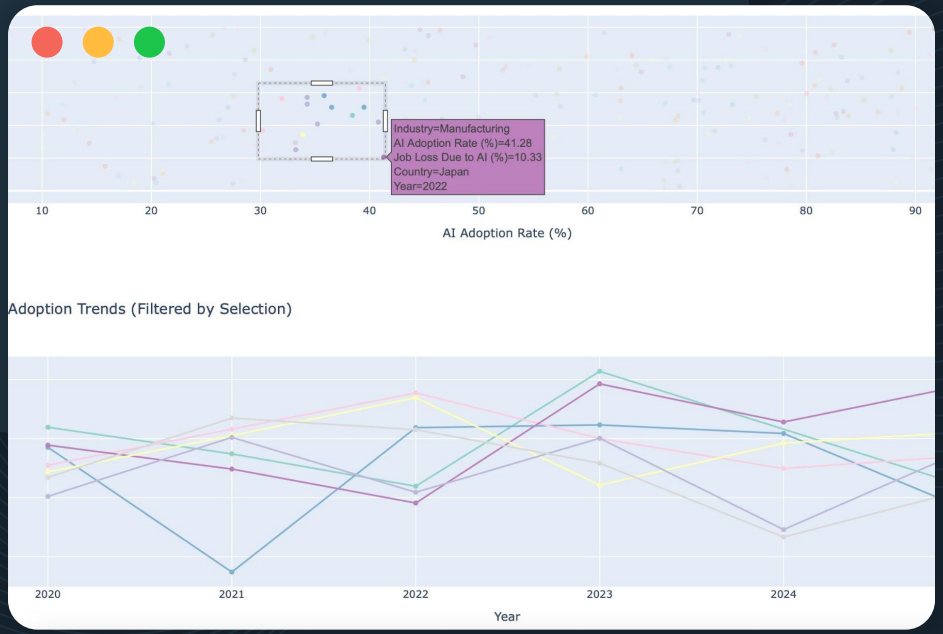
Visualization 3 - Bar Charts

- AI-Generated Content Volume by Industry
  - Height: total content per industry
  - Text: % share of global total
- Consumer Trust in AI by Regulation Status
  - 3 categories: Lenient, Moderate, Strict
- AI Tools Used Across All Industries
  - Ranked by frequency
  - Percentage labels



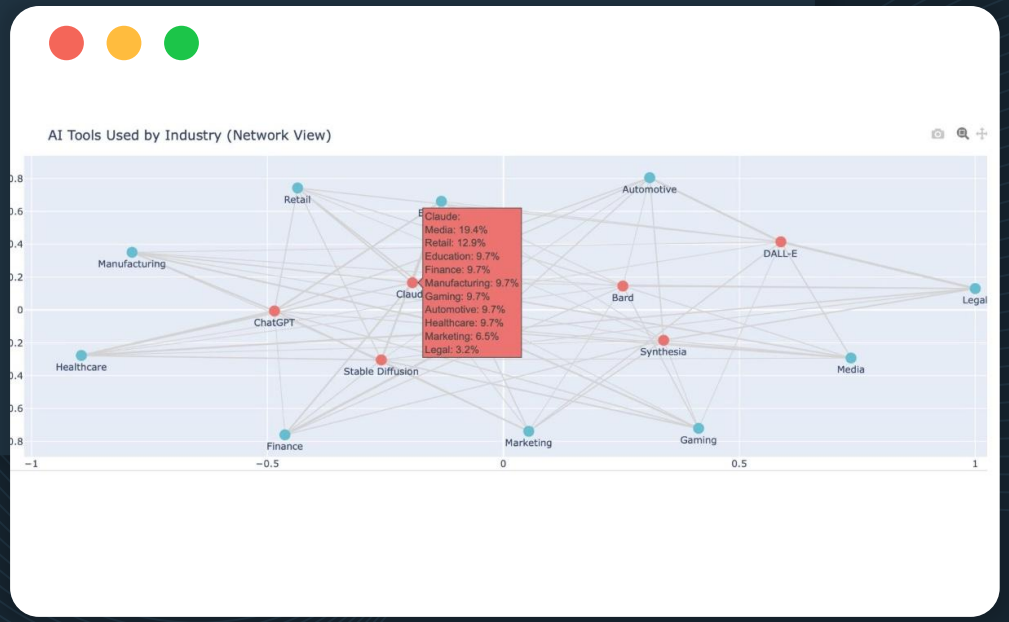
Visualization 4 - Scatter Plots

- AI Adoption vs. Job Loss/Revenue Increase
  - Each dot = one country-industry-year
  - X-axis: AI Adoption Rate
  - Y-axis: Job Loss or Revenue Increase
  - Toggle for metric
  - Color-coded by industry
- Linked View: Scatter → Line Chart
  - Select data points
  - Line chart updates to show trends of selected industries



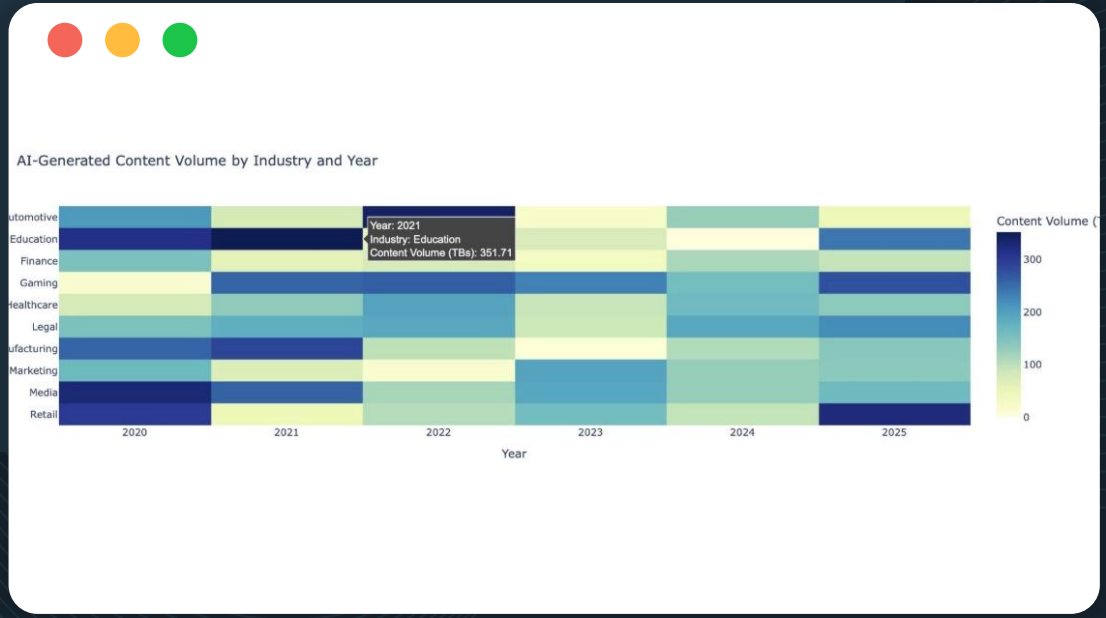
Visualization 5 - Network Graph

- AI Tools Used by Industries (Network View)
- Node types: AI tools vs. Industries
- Edge thickness: strength of association
- Hover: Industries/AI tools breakdown



Visualization 6 - Heatmap

- AI-Generated Content Volume by Industry and Year
- Industry × Year heatmap
- Color intensity = TBs of content



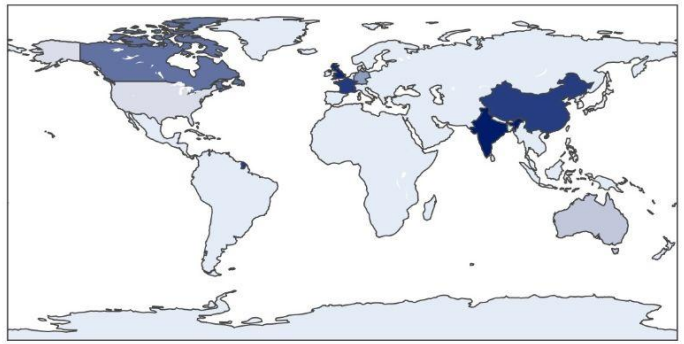
Impact of AI on Digital Media (2020–2025)

Animated: AI Adoption Over Time	Line Chart: Industry Trends	Industry: AI Content Volume	Bar Chart: Regulation vs. Trust	Scatter: Adoption vs. Impact	Linked: Filtered Industry Trends	AI Tools Usage	Network: AI Tool Usage by Industry

AI Content Volume

2021 2022 2023 2024

otion Rate (%) by Country in 2020



AI Ac

DEMO!

Limitations & Future Work

- Covers only the years 2020–2025
- Small size: 200 rows with overlapping entries
- Limited in scope and diversity
- Unclear data source may introduce bias
- No live updates or integration with external APIs

- Expand the Dataset
  - more countries, industries, and years
- Integrate Live Data Sources
  - Connect to APIs and auto-refresh dashboards for ongoing monitoring
- Explore UX/UI Improvements
  - Improve accessibility and optimize layout for other devices

Thank You!

Do you have any questions?