Interactive Dashboard for UK Tech Job Market Trends

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Aim

Design and develop an interactive dashboard that visualizes trends in UK technology job postings, incorporating user-driven controls and dynamic visual features to support decision-making

Background & Problem Domain

The UK job market is changing rapidly, especially in tech, where new tools , software and hardware continue to drive innovation. Hybrid working and economic shifts add even more complexity when it comes to analysing the tech job market.

Job seekers now struggle to understand which roles and skills are actually in demand and how these demands and salaries may vary across different regions of the UK. Employers and educators also need up to date insights so they can plan for workforce training.

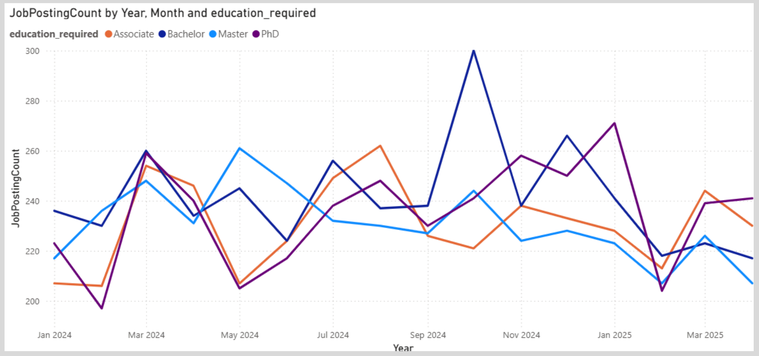

Figure 1. Monthly count of job postings via education requirement (based on dataset "Global AI Job Market & Salary Trends 2025")

Job posting data can help answer these questions. It contains valuable information on roles, skills, pay, and demand.
However, the data is usually unstructured and hard to analyse manually.

Data science techniques can help make it possible to extract meaningful insights that support smarter , more informed career decisions and more effective hiring strategies Spiridonova et al. suggest that universities must continuously assess labour market needs to ensure graduates develop skills that remain in demand (2020).

Objectives

- Conduct a feasibility study on existing and emerging trends within the UK technology job market.
- Administer data acquisition, manipulation, and processing from reliable data sources.
- Design, build, and debug an interactive dashboard to visualize trends chosen as a result of the feasibility study.
- Evaluate, test, and validate the usability of the dashboard.
- Stretch goal (time permitting): Additional feature integration, for example, skill extraction from a job role recommendation, thereby enhancing the scalability of the product.
- Stretch goal (time permitting): Implement a chatbot to allow further information on job rolls or skills

Methodology - CRISP-DM

This project follows a **CRISP-DM** framework to guide data collection, preparation, analysis and deployment. This model was chosen due to its flexibility and its support of an iterative workflow. This is confirmed by Saltz who tells us that CRISP-DM is both iterative and can be implemented without much training.

Business Understanding

This project focuses on creating a dashboard to allow users to analyse the current and historical skill, demand, salary, and location trends within the UK job market.
This goal is to allow users to gain insights into the job market in order to make more informed decisions.
The main research questions are :

- Which tech skills and roles are most in demand across the UK
- How do salaries vary across job roles , skill expectations, and job locations.
- How has job demand changed over time.
- How can the collected information be visualised to support informed decision making.

Data Understanding

Data will be collected mainly from the Adzuna API(Adzuna Ltd, 2025) , which provides 12 months of UK job posting data. Secondary sources will be used for backup and historical comparison, including the UK Office for National Statistics and Kaggle datasets.
The data will be explored to identify its structure, assess missingness and duplicate data, and verify its suitability for analysing trends. Descriptive statistics and visualizations will be used to uncover potential data quality issues and patterns.

Data Preperation

Raw datasets will be cleaned and standardised using python with libraries such as Pandas and NumPy. Null values, inconsistencies and duplicates will be handled. Key features such as job titles, skills, salaries, locations, and posting dates, will be extracted and structured into a database to ensure efficient querying.

Modelling

EDA will be used to reveal trends in job and skill demand, popular locations, and salary distributions. Grouping and clustering techniques will be used to identify roll-skill relationships and variations in regions.
Visualisations will be created using Matplotlib, and PowerBI

Deployment

An interactive Streamlit dashboard will be developed and connected to the database.
Users will be able to filter job results by role, region, salary range, and skills.
Time permitting, users will also be able to upload their CV to receive a list of extracted skills and potential job roles. The dashboard will visualise key trends through charts, to support job market exploration.

Evaluation

Usability and insight quality will be evaluated through peer reviews and supervisor feedback. Results will be compared with existing research to validate findings.

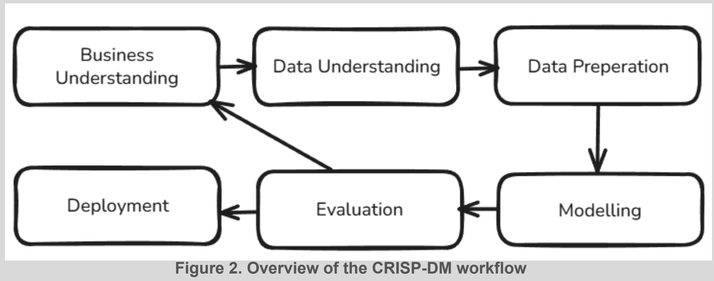

Figure 2. Overview of the CRISP-DM workflow

Project Management

This project will be managed using a CRISP-DM workflow, broken into clear weekly milestones. Progress will be reviewed regularly with my university supervisor to stay aligned with objectives and manage risks early.

Phase	Timeframe	Key Tasks / Deliverables
Business Understanding	20/10/25 - 10/11/25	Finalise project scope, research questions, and dataset plan. Create and submit poster and ethics form.
Data Understanding	06/11/25 - 10/12/25	Collect and investigate job datasets (Adzuna API, Kaggle). Evaluate data quality and structure.
Data Preparation	05/12/25 - 10/01/26	Clean, merge and transform data. Do exploratory data analysis.
Modelling / Analysis	10/01/26 - 28/02/26	Do feature engineering, clustering or trend detection. Extract key insights for dashboard.
Deployment	15/02/26 - 30/03/26	Build and test Streamlit dashboard.
Evaluation	20/03/26 - 10/04/26	Refine Streamlit dashboard and get users to test and provide feedback. Implement feedback and re-test.
Reporting	01/04/2026 - 25/04/26	Finalise report, prepare for viva and ensure Github up to date.

Risks & Mitigation

API access issues:
Use backup datasets

Poor data quality
Clean and impute data where required.

Too broad a scope
Focus on 2-3 insights to stay achievable.

Time pressure
Have bi-weekly supervisor check ins to maintain progress.

Software bugs
Use GIT for version control and rollbacks of code.

Tools & Skills

Data Cleaning, EDA & Visualisation

- Python (Panda, Numpy, Matplotlib)
- PowerBI

Dashboard Development

- Python
- Streamlit

Data storage and querying

- SQLite / Firebase / 3rd party API based database

Version Control

- GitHub

Key Skills
EDA, Dashboard Design, Python, Data Sourcing

Ethics

All datasets used are publicly available (Adzuna API, Kaggle).
No personal or sensitive data is collected.
The project complies with University of Westminster's research ethics policy.
Ethics form to be submitted by 13 November 2025.

References

Adzuna.com. (2025). 'Overview'. [online] Available at: https://developer.adzuna.com/overview. (Accessed: 12 November 2025)
Sajjad, B. (2025) 'Global AI Job Market & Salary Trends 2025 [Dataset]', Kaggle. Available at: https://www.kaggle.com/datasets/bismasajjad/global-ai-job-market-and-salary-trends-2025?select=ai_job_dataset1.csv (Accessed: 28 October 2025)
Saltz, J.S. (2021) 'CRISP-DM for data science: Strengths, weaknesses and potential next steps', 2021 IEEE International Conference on Big Data (Big Data), Orlando, FL, USA, pp. 2340. doi: 10.1109/BigData52589.2021.9671634.
Spiridonova, E.V., Melikhova, N.V. and Palamarchuk, L.N. (2020) 'Labour market analysis', IOP Conference Series: Materials Science and Engineering, 753(5), p. 052057. Available at: https://doi.org/10.1088/1757-899X/753/5/052057 (Accessed: 28 October 2024)