

Analyzing Job Market Data

Executive Summary

This interactive Power BI dashboard explores data science job market trends between 2017 and 2021, providing deep insights into job postings, demand for roles and skills, average salaries, and experience requirements. The dashboard is designed to help job seekers, workforce planners, educators, and recruiters understand the evolving landscape of data science careers by highlighting which roles, companies, and skills are most in demand.

Business Objective

The primary goal is to uncover actionable insights into the data science job market, enabling users to:

- Identify top hiring job titles and companies
- Track shifts in required years of experience and salaries
- Analyze the prevalence of specific technical skills across various job roles
- Explore trends by company industry and size

Data Sources

- Collected data on job postings from multiple online recruitment platforms (2017–2021)
- Key fields: Job Title, Company, Industry, Position Level, Size, Skills, Posting Date, Salary, Experience Years

Data Preparation & Model

- Cleaned and harmonized raw job posting data, resolving inconsistent job titles and skill names
- Handled missing or anomalous salary and experience values
- Built robust relationships between job postings, company info, and skill tables
- Created DAX measures for aggregating average pay, posting counts, and years of experience

Dashboard Structure & Navigation

Landing Page

- Branded "DATA SEARCH: Data Science Job Market Insights"
- Options to explore interactive dashboards by **Jobs**, **Skills**, or **Company**

1. Company Overview

Key Visuals:

- **Bubble Chart:** Shows average years of experience vs. company industry, with bubble size indicating posting count, and color by company size.
- **Posting Leaderboard:** Table lists jobs and companies with the highest posting counts (e.g., Toptal, Perfcient, JioBot).
- **Filters:** Users can explore by job title, company size, industry, and posting date.

Insights:

- Technology firms and consultancies are top recruiters for data roles.
- Larger companies tend to demand higher experience averages.
- Certain industries consistently post more positions, especially for engineers and analysts.

2. Jobs Overview

Key Visuals:

- **Treemap:** Reveals which job titles dominate postings (Data Engineer, Data Scientist, Data Analyst). Within each title, the top associated skills are visible.
- **Posting Trend Line Chart:** Tracks growth in job postings by year and job level (associate, director, entry, etc.).

- **Bar Chart & Table:** Visualizes experience levels required and breaks down posting counts by job level.

Insights:

- Rapid growth in total data jobs, especially for junior and associate roles post-2019.
- Data engineering consistently tops demand, but data science and analyst roles remain significant.
- Most roles require between 2–5 years’ experience, with high-level roles rarely available for new graduates.

3. Experience and Salary Analysis

Key Visuals:

- **Scatter/Line Plot:** Examines relationship of average pay to years of experience across job titles.
- **Bar Chart:** Average experience required by position level (executive, director, etc.).

Insights:

- Pay significantly increases with years of experience and is highest for executive-level positions.
- Even entry-level jobs often seek foundational experience, highlighting the competitive nature of the field.
- Salary progression curves vary across job roles; “Data Engineer” and “Data Scientist” tend to command higher salaries at all levels.

4. Skills Overview & Analysis

Key Visuals:

- **Bar Chart:** Rankings of most sought-after job skills across postings (sql, python, cloud, machine_learning, aws, spark).
- **Treemap:** Count of job skills appearing with each title, clearly visualizing the technical landscape for each role.
- **Skill Frequency Table:** Percentage of postings requiring each skill by role.

- **Time Series Line Chart:** Tracks percentage occurrence of top skills in postings over years.

Insights:

- **SQL** and **Python** are the most universally required technical skills, followed by **cloud**, **machine learning**, and **aws**.
- Job titles differ in skill emphasis:
 - **Data Engineers:** Require strong cloud, programming, and big data tool knowledge
 - **Data Scientists:** Emphasize machine learning, python, and advanced analytics
 - **Business Analysts/Data Analysts:** Focus on SQL, excel, and reporting tools
- Skill trends show increasing demand for cloud, programming, and ML tools year-on-year.

Filters & Interactivity

- Side panels allow exploration by job title, job level, company, industry, company size, and posting date.
- All visuals update based on selected filters, supporting dynamic investigation.
- Users can drill down from market-wide trends to granular views (by skill, company, or role).

Conclusions & Recommendations

- **For Job Seekers:** Focus learning on SQL and Python, plus cloud and machine learning if aiming for engineering or science roles. Gain at least 2–3 years of project or real-world experience to maximize employability.
- **For Employers:** Keep competitive by offering skill development in trending areas (cloud, ML). Broaden talent search for entry/junior roles if skills are present even with less experience.
- **For Educators or Bootcamps:** Align curriculum to ensure strong coverage of top-ranked data skills; foster hands-on, project-based experience.

Limitations

- Data limited to postings from 2017–2021; trends beyond this period may differ.
- Salary and experience values depend on self-reporting and recruiter accuracy.
- Some specialized roles or industries may be underrepresented.

Appendix (Optional)

- Full DAX formula list, model relationships diagram, glossary of job titles & skills.