What is the age distribution of tech workers, and is there evidence of age discrimination in compensation?

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Business Context: Why This Matters

- Tech firms depend on a highly skilled workforce which makes compensation and talent pipelines important.

- Due to rapid change in technology,, companies often are pushed to prioritize younger workers for speed and adaptability. OECD (2024),

- This raises concerns about potential age bias in hiring, pay, and promotion.

- Organizations with equitable practices gain access to a broader pool of experienced talent, improving innovation and stability.

- The research supports leaders in making data-driven decisions about HR policy, hiring, and promotion systems.

Data Overview

- Data Source: Survey of full-time U.S. tech employees.(Survey USA)

- Sample Includes:

  - Age group (binned ranges)

  - Annual salary (rounded; unrealistic values removed)

  - Years of experience (binned)

  - Field of work (software engineering, data, support, etc.)

- Key Variables:

  - Dependent: Salary

  - Independent: Age (also controlling for experience)

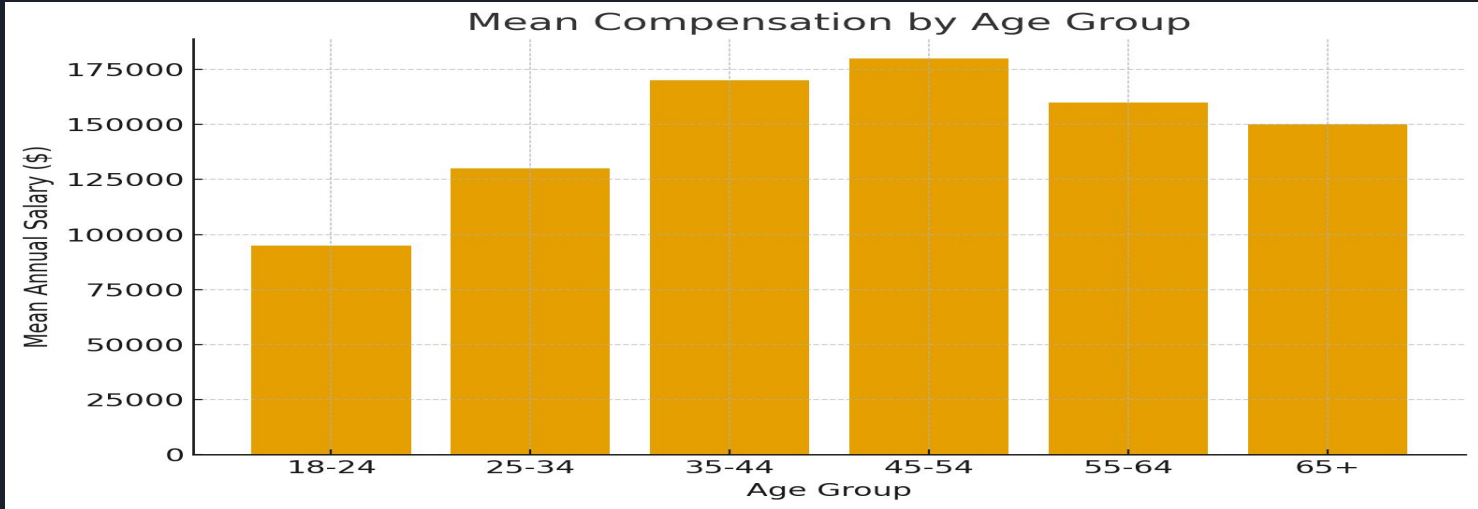 - Methods: Cleaning, binning, visualizing with Python/pandas/matplotlib.

Age Distribution

Age Distribution of Tech Workers
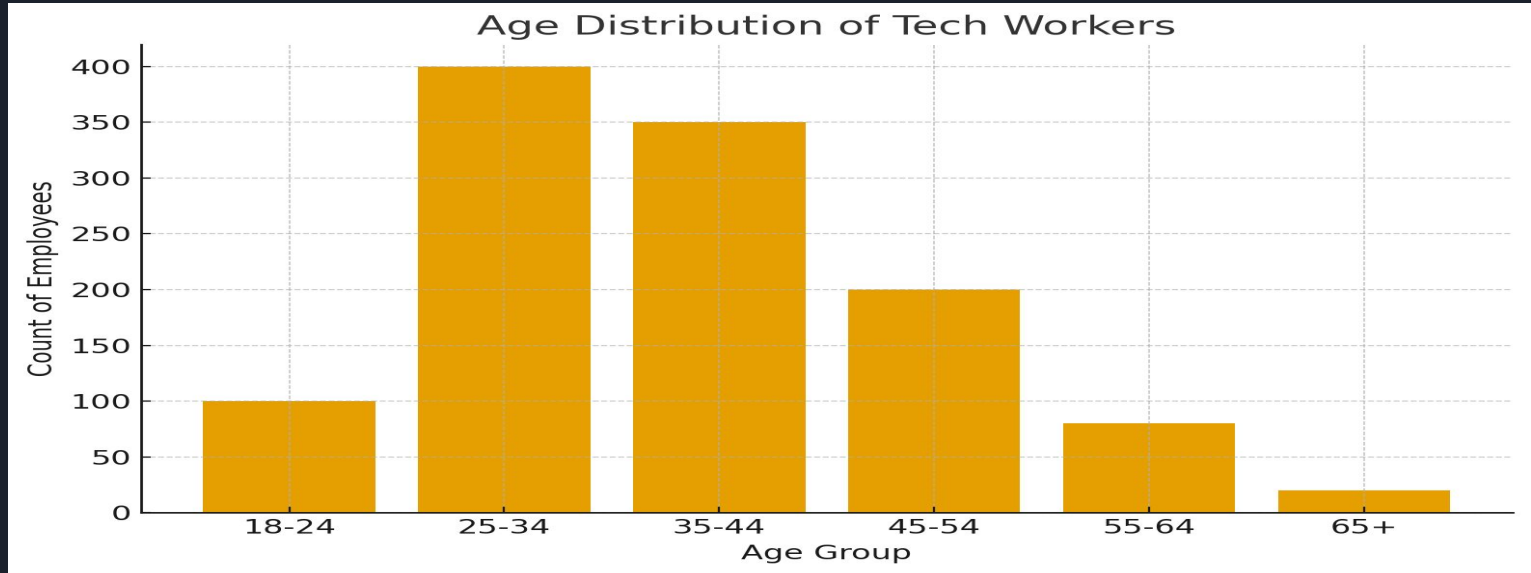
- Tech workforce is heavily concentrated in the 25–34 and 35–44 groups.
- Under 25 and 55+ groups are much smaller.
- Industry is predominantly under 45.

Compensation by Age

Mean Compensation by Age Group

- 45–54 has highest mean salary (~$180k).
- 35–44 follows closely.
- 18–24 group has the lowest average salary (~$95k).
- Raises questions about the degree to which increases reflect experience vs. structural pay differences.

Statistical Results

- Performed a t-test of ages 25-34
- These were our findings:
  - T Statistic: -0.574
  - P-Value: 0.623
  - 0.623> p=.05
- Fail to Reject the null hypothesis
- No statistically significant difference
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- Salary increases with age → consistent with experience accumulation.

- After controlling for experience:

  - Workers 40+ consistently earn more than younger counterparts.

  - Gap is widest among less-experienced and mid-career employees.

  - Gap narrows only for the most experienced groups.

- Indicates age-linked pay disparities not fully explained by experience.

Interpretation

- The tech workforce is heavily concentrated with employees under age 45, with very limited representation among workers 55+.

- Salary rises with age as expected, but the gaps between younger and mid-career groups are large enough to where experience alone can't be the only aspect for pay inequity.

- Younger workers start with a disadvantage with lower starting salary bands, while the older (experienced) workers may face reduced mobility or bias in hiring.

- These patterns suggest that inequities in pay, promotion, and access to higher-level roles based on age are present in the tech community.

- Overall, the results show that the tech community is getting younger due to the new innovations and that pay differences are still a problem that has to be addressed by organizations.

Industry Recommendations

- Establish salary transparency and disclose ranges.
- Conduct annual internal salary reviews with an equity assessment by age.
- Investigate employment patterns to determine if an average age difference exists.
- Promote advancement criteria related to performance (not age) to distinguish elevated criteria.
- Expand hiring practices to older generations to create a more diversified workforce.

Conclusion

- The technology workforce is predominantly younger with limited older workers.
- Compensation is positively correlated with age but years of experience does not account for the large pay gaps at every age.
- Evidence suggests that age-bias exists in entry-level compensation, promotions and job distribution.
- Findings support the need of salary transparency and equitable hiring and compensation assessments.
- The more equitable these processes are, the more attractive retention increases, talent pools grow, and organizational equity is established.

Questions ??
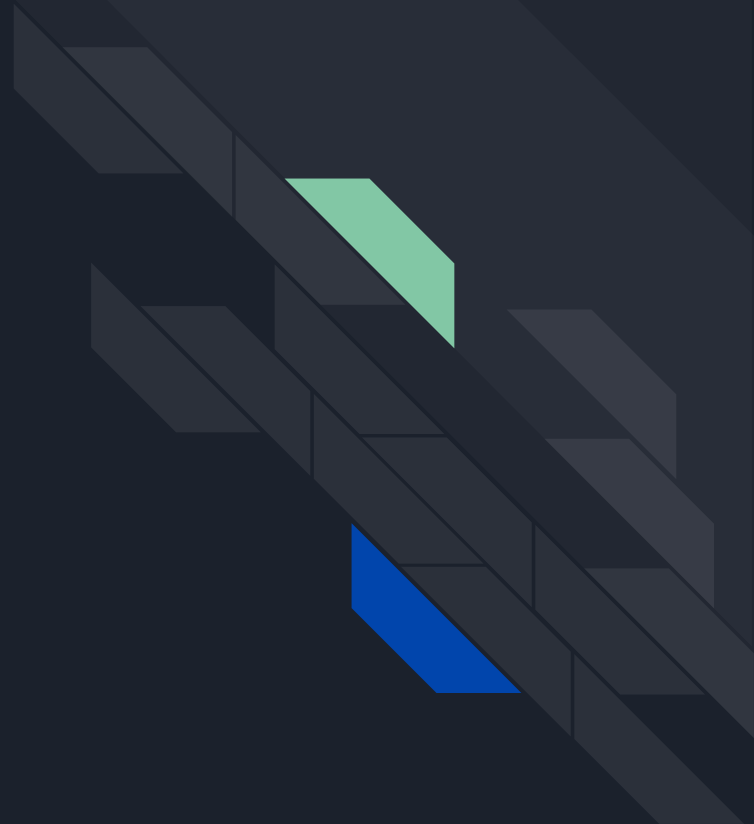
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