



**"Which demographic groups are most at risk of attrition,  
and what specific interventions can IBM implement to  
reduce turnover among these groups?"**

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# The Problem

## IBM's Attrition

At IBM, high attrition disrupts complex team dynamics, increases costs, and hinders productivity, emphasizing the need for targeted strategies to address the root causes effectively.

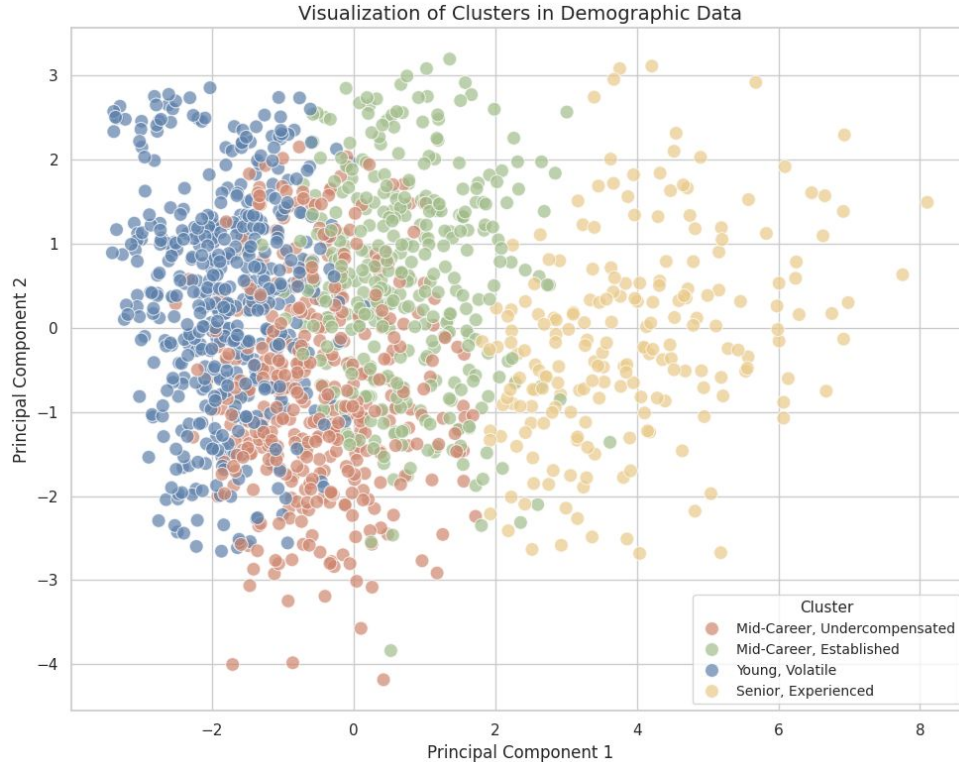
## One-Size-WON'T-Fit-All

Generic interventions, like minor pay increases or universal wellness programs, often miss the mark because they don't address the specific needs of at-risk groups.

## ***Targeted Solutions***

Recognizing that one-size-fits-all fails, I grouped employees by demographics and specific challenges, enabling IBM to target interventions effectively and address key attrition drivers.

# Demographic Clustering



**Approach:** Segmented employees using K-Means clustering based on demographic factors like age, education, job level, tenure, income, etc. (check documentation for details)

## Why Demographics?:

- Reflects inherent employee traits like career stage and experience.
- Hard to control by the company, unlike factors like workload or affecting satisfaction.

Demographic Feature	Young, Volatile	Mid-Career, Established	Senior, Experienced	Mid-Career, Undercompensated
Age	29.65	36.49	48.08	40.29
Education	2.62	3.01	3.06	3.10
Job Involvement	2.71	2.74	2.69	2.76
Job Level	1.26	2.18	4.14	1.86
Job Satisfaction	2.73	2.81	2.67	2.68
Monthly Income	\$3395.16	\$6459.95	\$15712.04	\$5560.69
Number of Companies Worked	1.18	1.68	3.50	4.97
Total Working Years	4.82	11.97	26.00	10.87
Years In Current Role	2.16	7.66	7.09	2.19
Years Since Last Promotion	0.82	3.91	5.23	0.74
Years With Current Manager	2.33	7.08	6.79	2.27

*P.S. Not every demographic feature is shown, only the interesting (highly variable) ones...*

#### Cluster 1 (Young, Volatile):

- Younger, less tenured, seeking rapid growth.

#### Cluster 2 (Mid-Career, Established):

- Stable mid-career employees with balanced pay and workload.

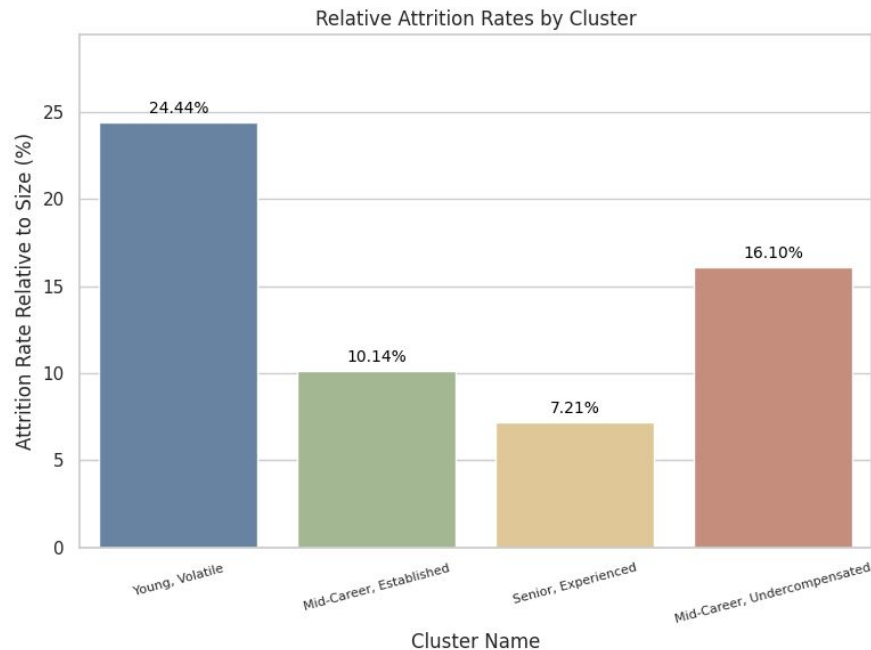
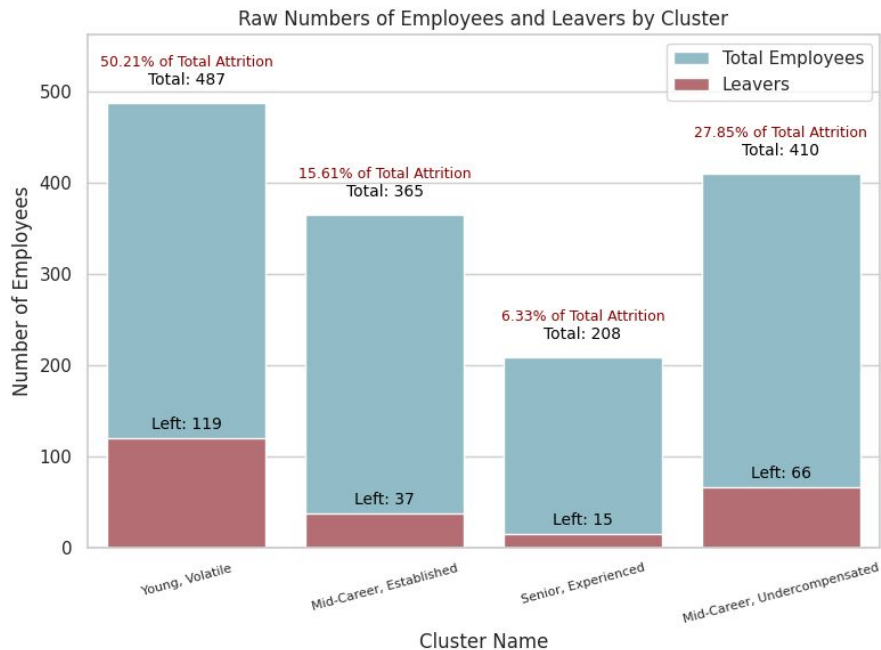
#### Cluster 3 (Senior, Experienced):

- Senior employees; stable, high compensation and job levels.

#### Cluster 4 (Mid-Career, Undercompensated):

- Mid-career, feeling underpaid; older age, lower salary, high attrition. Extremely prone to job-hopping (*# of companies worked*) for opportunities.

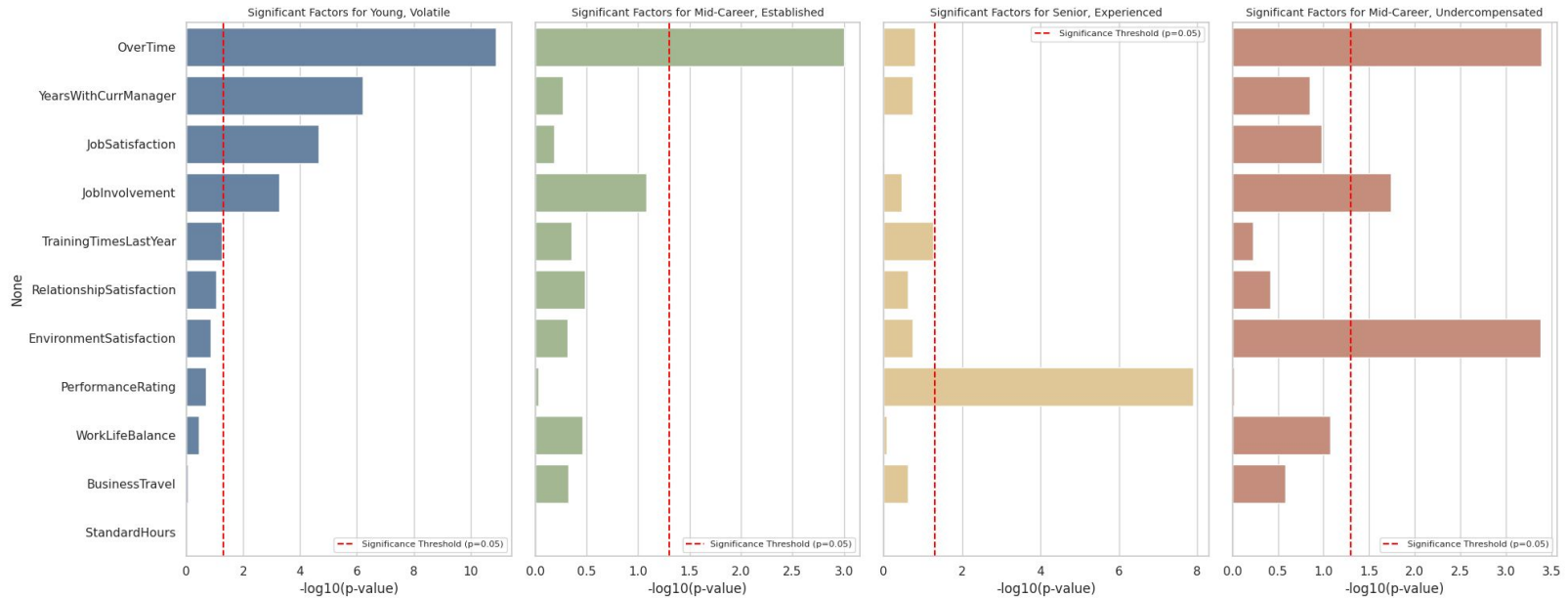
# Attrition Analysis



**High-Risk Groups:** Focus retention efforts on the "Young, Volatile" and "Mid-Career, Undercompensated" clusters, where attrition rates are highest.

*P.S. left is raw statistics for attrition by cluster, right has attrition adjusted relative to cluster. All is labeled on the graph.*

**Approach:** Used T-Tests and P-Values ( $p=0.05$  as threshold) to identify significant factors distinguishing those who left from those who stayed. Pearson correlation coefficients were then calculated for each significant factor to analyze how it relates to attrition



#### Cluster:

- Factor  
(correlation)

#### Young, Volatile:

- Overtime (0.34)
- Years w/ Curr. Manager (-0.22)
- Job Satisfaction (-0.2)
- Job Involvement (-0.16)

#### Mid-Career, Established:

- Overtime (0.2)

#### Senior, Experienced:

- Performance Rating (-0.11)

#### Mid-Career,

#### Undercompensated:

- Overtime (0.2)
- Job Involvement (-0.14)
- Environment Satisfaction (-0.19)

# Role Analysis



Out of 9 unique roles...

## Young, Early-Career Movers

- Research Scientists (33.9% of cluster)
- Laboratory Technicians (26.3%)

## Mid-Career, Established

- Sales Executive (41.1%)
- Manufacturing Director (14.8%)

## Senior, Experienced

- Manager (43.3%)
- Research Director (25.0%)

## Mid-Career, Undercompensated Roles

- Sales Executives (20.5%)
- Laboratory Technicians (21.5%)

# Potential Root Causes

## 1. Compensation Disparities in Mid-Career, Undercompensated Cluster

Mid-career employees frequently switch jobs potentially due to feeling underpaid, driven by high overtime (0.2), low job involvement (-0.14), and poor environment satisfaction (-0.19).

Addressing compensation gaps, reducing overtime, and enhancing engagement through growth opportunities can curb this attrition.

## 2. High Turnover Among Young, Volatile Employees

Young employees face high turnover due to heavy overtime (0.34), short tenure with managers (-0.22), which is probably due to the low job and environment satisfaction (-0.2).

Reducing overtime, boosting job satisfaction, and strengthening manager relationships through mentorship can stabilize this group and reduce burnout.



# Solutions

## Transform Performance Reports into Personalized Feedback Systems

The “Performance Rating” wasn’t strongly correlated to any cluster or phenomenon. So, utilize real-time, privacy-protected peer feedback and behavioral analytics. This approach leverages AI to analyze work patterns and sentiment, providing actionable insights that predict satisfaction and attrition risks. Anonymized feedback encourages honest participation, focusing on collaboration to make performance reviews more personal.

## Mentorship-Driven Career Pathway Program

To address high overtime and lack of satisfaction, implement a *Mentorship-Driven Career Pathway Program* that pairs them with mentors and creates clear, personalized promotion paths to various domains/industries within the company. Through career mapping, check-ins, and project-based learning, this program connects tasks to concrete long-term goals, enhancing job satisfaction. This fosters a sense of purpose, helping young employees find satisfaction in their work.



# Thank you for your time!

Now please let me in <3

*My analysis highlights high-risk employee demographics and key factors driving attrition. Targeted, data-driven interventions can effectively reduce turnover and improve employee satisfaction.*