

Technical Documentation: HR executive dashboard

1. Introduction

1. Purpose of the documentation:

This documentation provides a comprehensive overview of the HR Executive Dashboard, designed to deliver key insights into workforce dynamics. The dashboard helps HR executives monitor critical KPIs such as new hires, employee departures, and turnover rates to support strategic decision-making and workforce planning.

2. Scope:

The dashboard includes reports that cover:

- Tracking the number of new employees onboarded within specified periods;
- Monitoring employee resignation trends;
- Calculating and analyzing employee headcount and turnover rates;
- Insights into diversity, employee engagement, and forecasting future turnover;
- Simulations of hiring and departure scenarios to support proactive workforce planning;
- Visual summaries and trend analysis for workforce changes.

3. Target audience:

This documentation is intended for HR executives, HR analysts, and business leaders who require actionable insights into workforce metrics to optimize talent management and retention strategies.

2. Architecture and technologies

1. BI Tool:

The dashboard is developed in Power BI, a leading business intelligence platform used for interactive data visualization and analytics.

2. Data Sources:

The data is sourced from:

- Excel files in CSV format, downloaded from Kaggle – no copyright (<https://www.kaggle.com/datasets/ravindrasinghrana/employeeedataset?resource=download>) and extended up to May 2025 by creating artificial data with the help of an AI chat;
- The Wikipedia website https://en.wikipedia.org/wiki/List_of_states_and_territories_of_the_United_States.

These files contain HR-related datasets used for building the dashboard's metrics and reports.

3. ETL Process Description:

Data are ingested into Power BI using Power Query, where they are cleaned, transformed, and structured. The processed data are loaded into the Power BI data model. This model serves as the backbone for the dashboard's visuals and analytical logic.

4. Technology Stack:

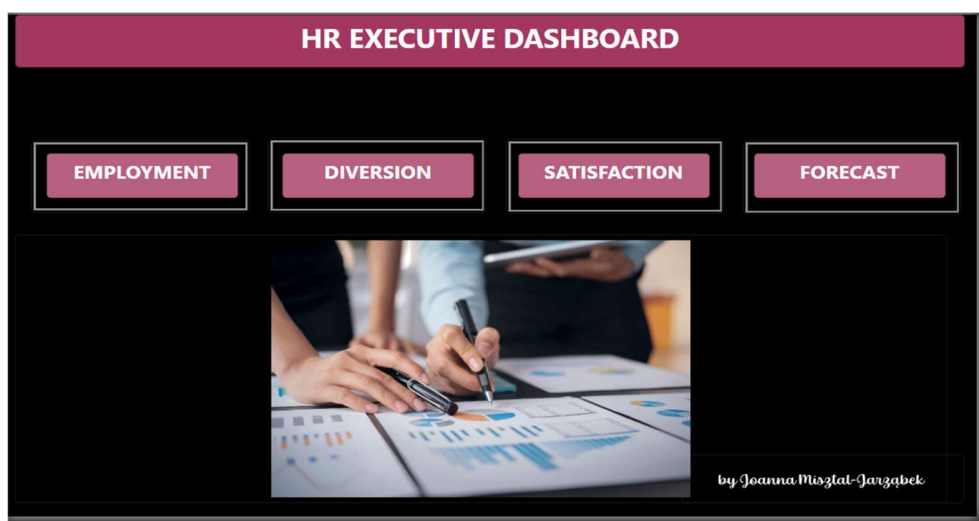
- Power Query (M language) – for data transformation and preparation
- DAX (Data Analysis Expressions) – for defining measures and calculated columns used in the visualizations
- Power BI Desktop – for designing the dashboard interface and interactive reports

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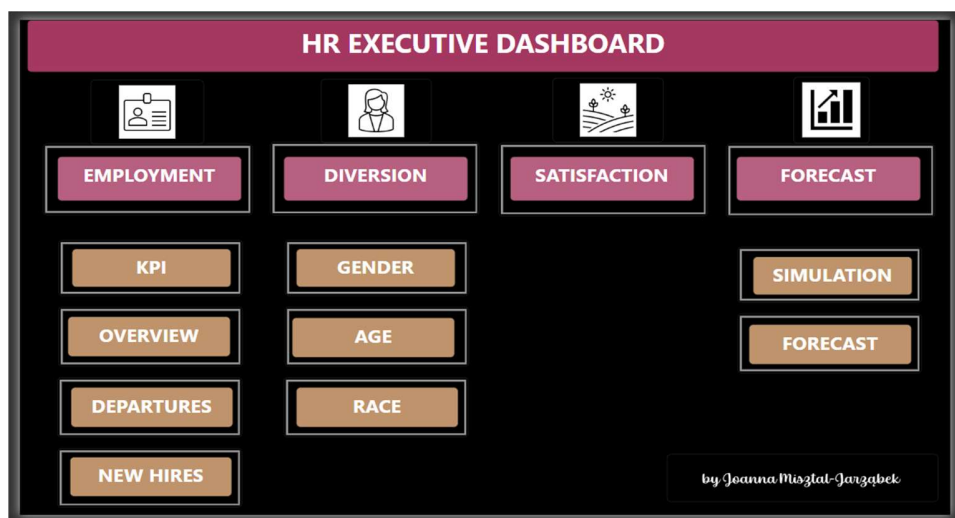
3. Functional description of the dashboard

1. Main view

The main view includes modules such as Employment, Diversion, Satisfaction, and Forecasting. From the main menu, you can easily navigate to the respective tabs for each of these modules.



From the main Employment menu, you can navigate to the KPI , Overview, Departures, and New Hires tabs. The Diversity menu allows access to the Gender, Age and Race tabs. Selecting Satisfaction takes you directly to the satisfaction report. Under Forecasting, you can access reports related to turnover forecasting or run simulations for hiring and employee departures at a specified level.



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From each report, you can easily return to the main menu by using the arrow located in the upper left corner and then you can select another report.

2. Reports:

- Report 1: EMPLOYMENT/KPI



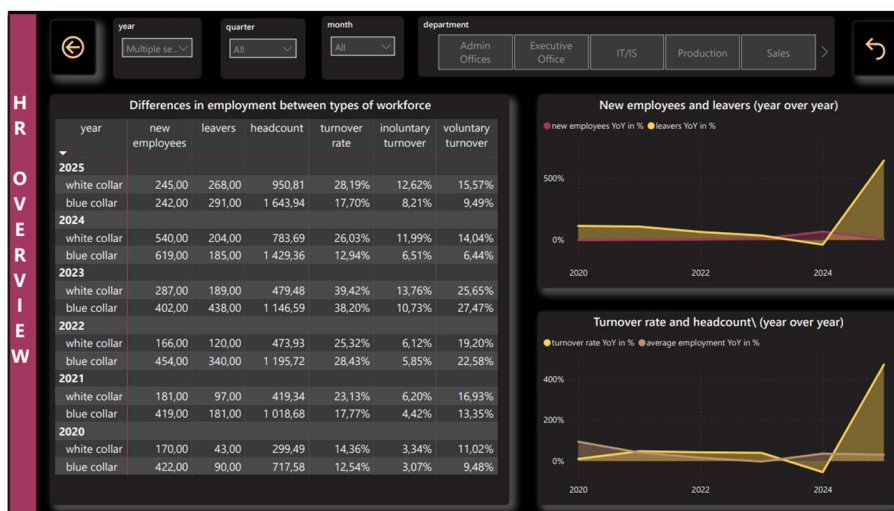
User interactions: filtering, sorting and view toggling, export for better data exploration.

The report presents key employment metrics, offering a clear overview of workforce dynamics. It includes a comparison of new hires and employee departures over time, as well as the current headcount.

Additionally, the report highlights the turnover rate, broken down into voluntary and involuntary components, providing valuable insights into employee retention and organizational stability.

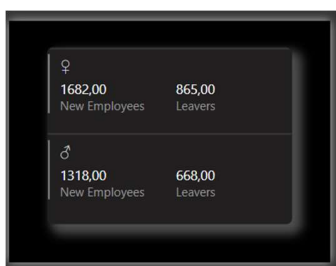
- Report 2: EMPLOYMENT/OVERVIEW

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User interactions: filtering, sorting, on-hoover data reveal.

The report presents the differences in employment between white-collar and blue-collar workers, covering aspects such as hires, terminations, headcount, and turnover rates. In the tooltip window, values can be viewed separately for men and women.



On the other hand, the report also illustrates year-over-year differences in hires and terminations, as well as turnover rates and headcount. The entire report can be filtered by individual departments.

- Report 3: EMPLOYMENT/DEPARTURES

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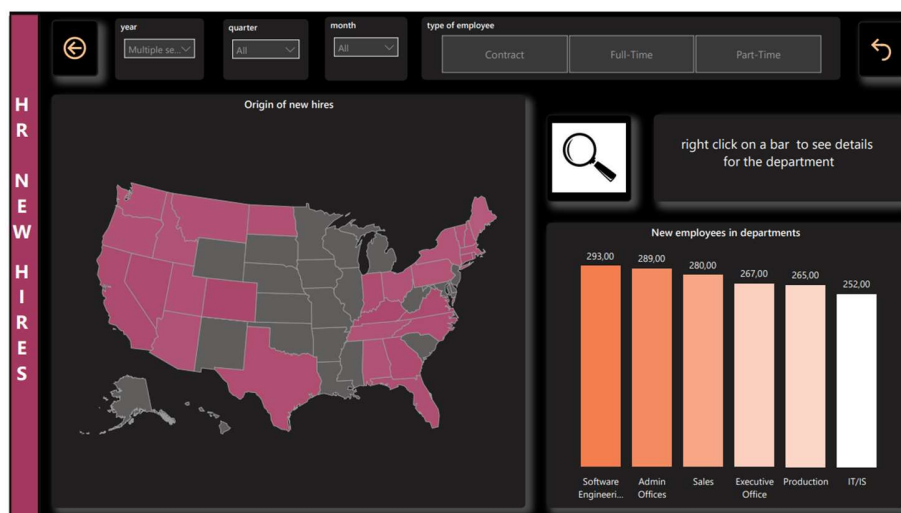
User interactions: filtering, sorting.

This report focuses on employee attrition within the organization. A heatmap clearly highlights departments where the number of employees leaving the company exceeds predefined acceptable levels.

Subsequent visualizations provide insights into the distribution and reasons behind both voluntary and involuntary exits. A bar chart further illustrates which employee groups experience the highest departure level.

The entire report can be filtered by type of employment

- Report 4: EMPLOYMENT/NEW HIRES



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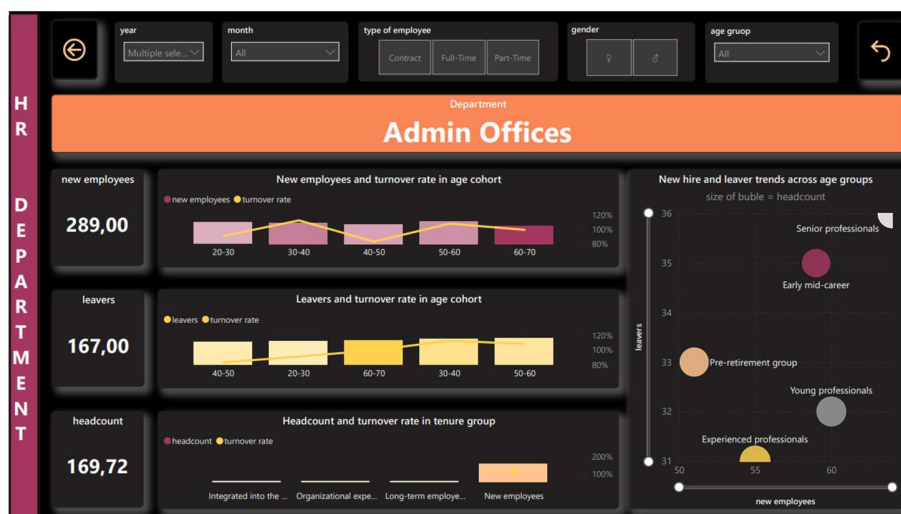
User interactions: filtering, sorting, drill-through (department), button action with web URL.

This report offers a closer look at newly hired employees. A map of the United States displays the states from which new employees originate—darker color intensity indicates a higher number of hires from a given state. Hovering over a state reveals the actual number of new employees from that location.

It also includes market benchmarks for job count in each state. This is accessible via a hyperlink embedded in an icon (magnifying glass) that links to external source <https://www.bea.gov/data/employment/employment-by-state/>.

The final visualization in this report shows the distribution of new hires across organizational departments. By clicking on a specific bar in the column chart, users can drill through to a separate view or report containing detailed information about that department.

The entire report can be filtered by type of employment.



This detailed departmental report provides valuable insights into workforce composition by highlighting key employment dynamics — including hires, departures and turnover rates. The data is segmented by age cohorts and tenure groups, offering a layered perspective on employee flow and retention trends across the organization. This enables department heads to identify demographic patterns and make informed, targeted decisions.

The entire report can be filtered by type of employment, gender and age group.

In order to return to the previous view, simply click the "back" arrow located in the top-left corner of the report

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- Report 5: DIVERSION/GENDER



User interactions: filtering, sorting.

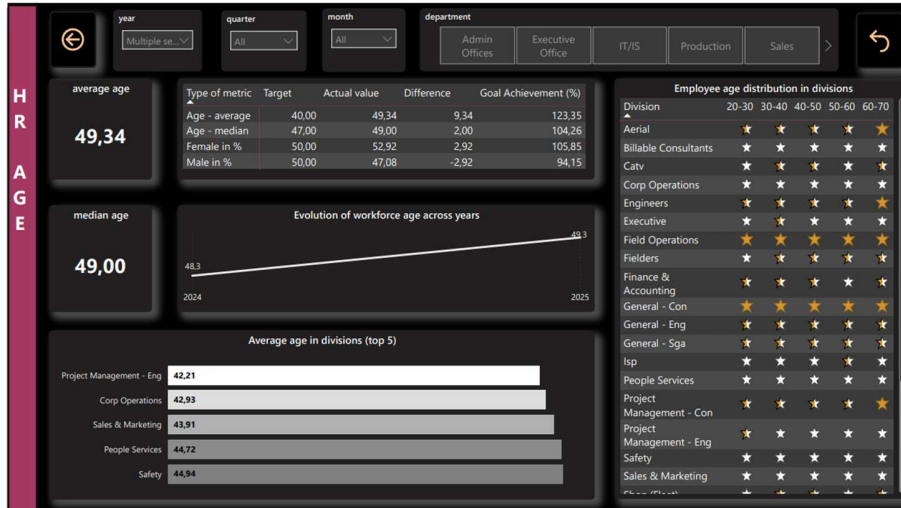
The first report in the Diversion section provides a comprehensive view of gender parity within the organization. It highlights the percentage representation of female and male employees across the entire workforce, as well as within distinct segments such as white-collar and blue-collar roles.

Additionally, the report breaks down this distribution by individual departments, offering valuable insights into where gender balance is being achieved and where disparities may still exist.

This analysis serves as a foundation for informed diversity and inclusion strategies, enabling leaders to identify opportunities for fostering a more equitable workplace.

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- Report 6: DIVERSION/AGE



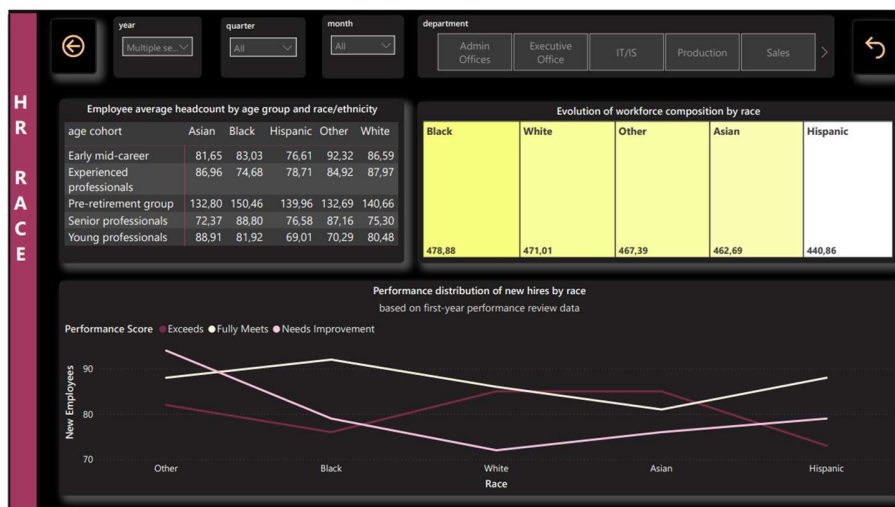
User interactions: filtering, sorting.

This report is focused on the age structure of employees within an organization. The dashboard provides several key insights and analyses related to workforce age distribution.

Key areas analyzed: average and median age, target vs. actual age values, age trend over time, average age by department (top 5 youngest departments), employee age distribution.

A detailed matrix shows the distribution of employee ages in 10-year intervals (decades) across various departments and roles. This granular view highlights which departments have concentrations of younger or older employees.

- Report 7: DIVERSION/RACE



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User interactions: filtering, sorting.

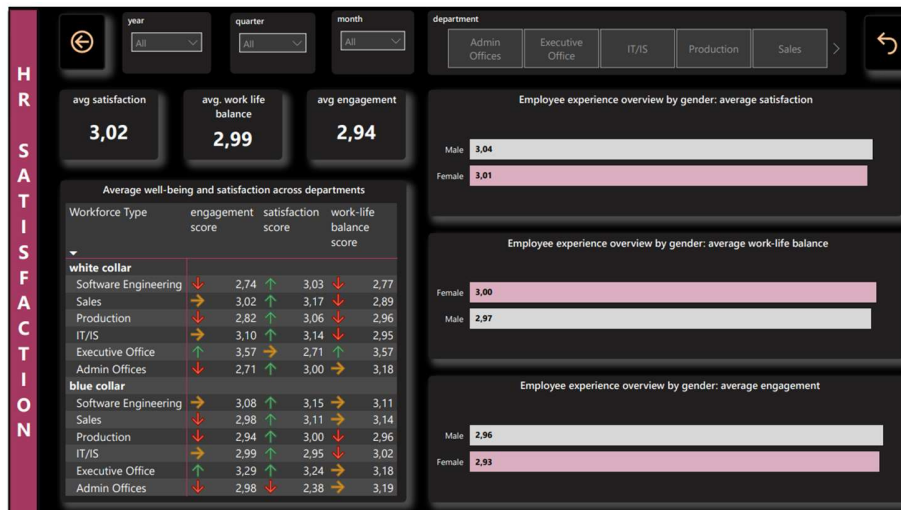
This report provides an analytical overview of workforce diversity and performance within the organization, focusing specifically on race/ethnicity and age cohorts. It is designed to monitor, compare, and understand workforce composition and performance trends across different demographic groups.

Visualization displays the average number of employees in each age cohort (e.g., Early mid-career, Experienced professionals, Pre-retirement group, Senior professionals, Young professionals) broken down by race/ethnicity (Asian, Black, Hispanic, Other, White).

The treemap display the current headcount for each racial group (Black, White, Other, Asian, Hispanic). The numbers below each group indicate the exact count, making it easy to compare the representation of each group within the organization.

The line chart at the bottom visualizes the performance ratings of new hires, segmented by race. Categories such as "Exceeds," "Fully Meets," and "Needs Improvement" are plotted, showing how new hires from different racial backgrounds perform according to recent review data.

- Report 8: SATISFACION



User interactions: filtering, sorting.

This report presents a comprehensive overview of employee satisfaction, engagement, and work-life balance across different departments and workforce types within the organization.

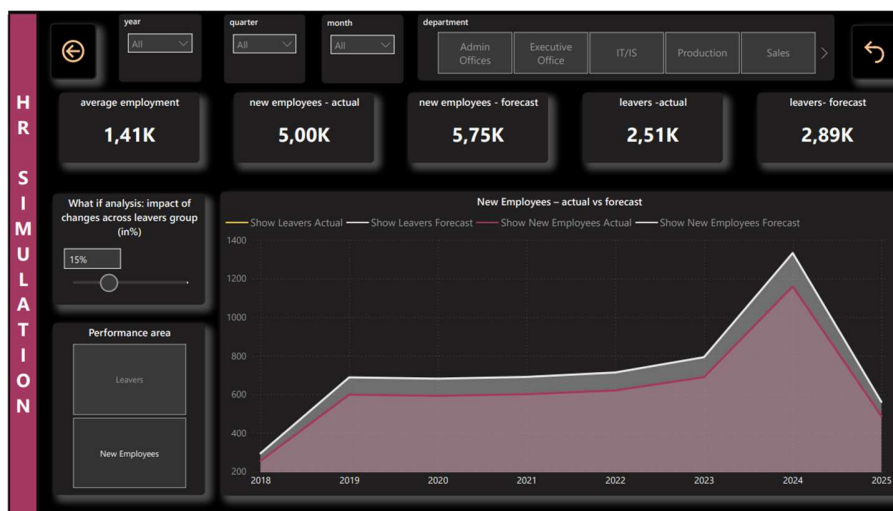
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Key Metrics shows the overall average satisfaction score among employees, the average score reflecting employees' perception of their work-life balance, the overall average engagement score.

Departmental Analysis presents average scores for engagement, satisfaction, and work-life balance across departments, divided into white-collar and blue-collar workforce types.

On the right, three horizontal bar charts compare employee experience by gender (male and female) for: average satisfaction, average work-life balance and average engagement. The bars show the average score for each metric, making it easy to spot any gender disparities.

- Report 9: FORECAST/SIMULATION



User interactions: filtering, what-if analysis, view toggling.

This report is designed to analyze and simulate key HR metrics related to employee headcount, new hires, and leavers within the organization. It offers interactive features to help users understand both historical trends and the potential impact of changes in employee turnover.

What-If Analysis allows users to simulate the impact of changes in the leavers group by adjusting the percentage value. This helps visualize how an increase or decrease in employee turnover would affect the overall HR metrics.

Users can switch between analyzing leavers or new employees, adjusting the focus of the dashboard. The line chart visualizes the actual and forecasted numbers of leavers and new employees across years. This enables them to quickly identify trends, compare actual outcomes with forecasts, and assess the effects of simulated changes.

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- Report 10: FORECAST



User interactions: filtering.

This report visualizes the employee turnover rate over time and provides a forecast for future trends. It is designed to monitor historical turnover rates and anticipate future changes within different departments.

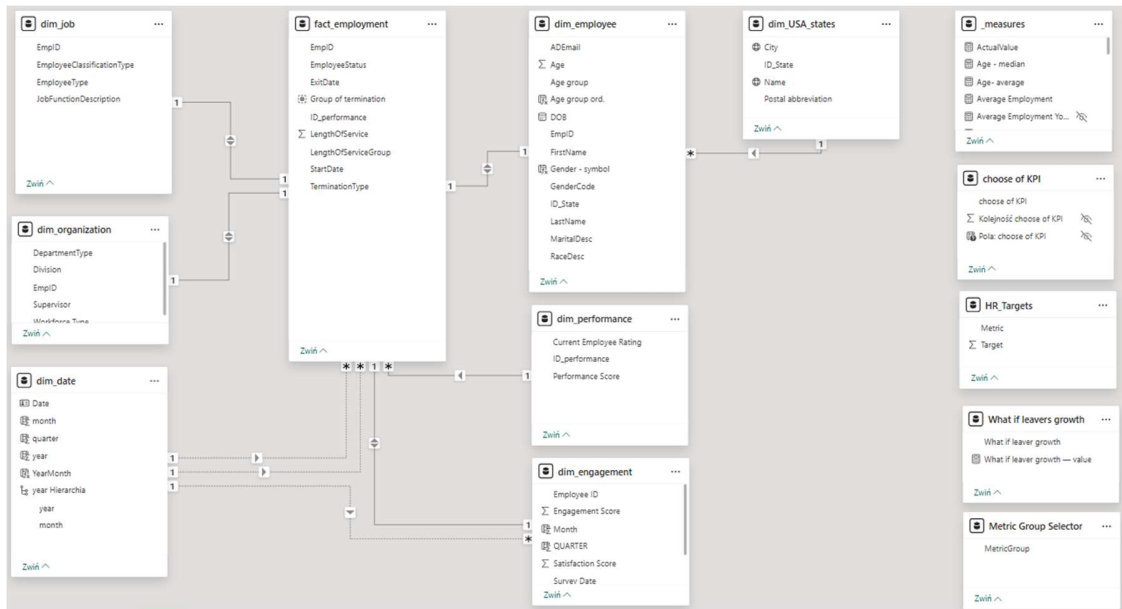
Line chart displays the turnover rate (%) across the years, with each data point labeled for clarity. The chart extends into the future, showing a forecasted turnover rate with a dotted line and a shaded area representing the confidence interval or possible range of outcomes.

Forecasting supports HR planning by providing an outlook on future turnover rates, helping organizations prepare for potential staffing challenges.

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3. Data model

Data model structure in the HR Executive Dashboard:



The data model is designed to support HR analytics and reporting. It consists of multiple interconnected tables (dimensions and facts) that together enable detailed analysis of employee data, organizational structure, performance, engagement, and key HR metrics.

Key Components:

1. dimension tables:

- **dim_job:** Contains job-related attributes such as employee type and job classification;
- **dim_organization:** Defines organizational structure, including department type, division and workforce type;
- **dim_date:** Standard date dimension with fields for date, year, quarter, month, enabling time-based analysis;
- **dim_employee:** Stores employee information, including unique employee ID, gender, age, position, and location;
- **dim_USA_states:** Contains information about U.S. states, used for geographic segmentation.

2. fact and supporting tables:

- **fact_employeement:** The central fact table, capturing employment events and statuses. It includes references to employee, job, and organization, as well as employment type, start/end dates, and termination reasons;

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- **dim_performance:** Holds employee performance data, such as current rating and performance score;
- **dim_engagement:** Contains employee engagement survey results, including engagement scores and survey dates.

3. KPI and calculation tables

- **measures:** Stores calculated metrics;
- **choose od KPI's parameter table** used as a parameter for dynamic reporting;
- **HR_targets:** Contains HR target values for benchmarking and goal tracking;
- **What-if analysis:** Supports scenario analysis by allowing users to simulate changes in different rates;
- **Metric Group Selector:** Enables switching between different metric groups or perspectives in the dashboard.

Relationships:

Fact_employment acts as the central hub, linking to employee, job, organization, and date dimensions. Other tables (e.g., performance, engagement) are connected via EmpID, allowing for multi-faceted analysis of each employee's life and experience.

4. Definitions of Measures:

- **Leavers measure** calculates the number of unique employees who exited the organization within the selected date range.

```
Leavers =
CALCULATE(
    DISTINCTCOUNT(fact_employment[EmpID]),
    USERRELATIONSHIP(fact_employment[ExitDate], 'dim_date'[Date]),
    FILTER(
        fact_employment,
        NOT ISBLANK(fact_employment[ExitDate]) &&
        fact_employment[ExitDate] >= MIN('dim_date'[Date]) &&
        fact_employment[ExitDate] <= MAX('dim_date'[Date]))))
```

- **New Employees measure** calculates the number of unique employees who started employment in the selected months, based on the YearMonth context from the date dimension.

```
New Employees =
CALCULATE(
    DISTINCTCOUNT(fact_employment[EmpID]),
    USERRELATIONSHIP(fact_employment[StartDate], 'dim_date'[Date]),
    FILTER(
        fact_employment,
```

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*DATE(YEAR(fact_employment[StartDate]),
MONTH(fact_employment[StartDate]), 1)
IN VALUES('dim_date'[YearMonth]))*

- Average Engagement measure calculates the average engagement score from employee surveys, ensuring the date filtering is based on the survey date by activating the appropriate relationship with the date table.

*Average Engagement =
CALCULATE(
AVERAGEX(
dim_engagement,
dim_engagement[Engagement Score]
),
USERRELATIONSHIP(dim_engagement[Survey Date], dim_date[Date]))*

- Average Satisfaction measure calculates the average satisfaction score from employee surveys, ensuring the date filtering is based on the survey date by activating the appropriate relationship with the date table.

*Average Satisfaction =
CALCULATE(
AVERAGEX(
dim_engagement,
dim_engagement[Satisfaction Score]
),
USERRELATIONSHIP(dim_engagement[Survey Date], dim_date[Date]))*

- Average Well-being Score measure calculates the average well-being score from employee surveys, ensuring the date filtering is based on the survey date by activating the appropriate relationship with the date table.

*Average Well-being Score =
CALCULATE(
AVERAGEX(
dim_engagement,
dim_engagement[Work-Life Balance Score]
),
USERRELATIONSHIP(dim_engagement[Survey Date], dim_date[Date]))*

- Female Amount AVG measure filters the employee data to females and then calculates the average employment measure for this group, allowing analysis of workforce metrics by gender.

*Female Amount AVG. =
CALCULATE(*

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*[Average Employment],
FILTER(dim_employee, dim_employee[GenderCode] = "Female"))*

- Female in % measure calculates the average employment for female employees.

*Female in % = DIVIDE(
CALCULATE([Average Employment], dim_employee[GenderCode] = "Female"),
[Average Employment])*

- Male Amount AVG measure filters the employee data to males and then calculates the average employment measure for this group, allowing analysis of workforce metrics by gender.

*Male Amount AVG. =
CALCULATE(
[Average Employment],
FILTER(dim_employee, dim_employee[GenderCode] = "Male"))*

- Male in % measure calculates the average employment for male employees.

*Male in % = DIVIDE(
CALCULATE([Average Employment], dim_employee[GenderCode] = "Male"),
[Average Employment])*

- Dynamic title measure is used to create visualization titles that automatically change based on user selections.

*Dynamic Title =
SWITCH(
SELECTEDVALUE('Metric Group Selector'[MetricGroup]),
"New Employees", "New Employees – actual vs forecast",
"Leavers", "Leavers – actual vs forecast",
"Select a metric group on a slicer to display")*

- Leavers Forecast measure is used to predict the number of employees who are expected to leave the organization in the future.

*Leavers Forecast =
[Leavers] * (1 + [What if leaver growth — value])*

- New Employees Forecast measure is used to predict the number of people who are expected to join the organization in the future.

*New Employees Forecast =
[New Employees] * (1 + [What if leaver growth — value])*

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- Show Leavers Actual measure is used to dynamically display the Leavers measure only when the user selects the "Leavers" metric group in a slicer.

Show Leavers Actual =

```
IF(
    SELECTEDVALUE('Metric Group Selector'[MetricGroup]) = "Leavers",
    [Leavers],
    BLANK())
```

- Show Leavers Forecast measure is used to dynamically display the Leavers Forecast measure only when the user selects the "Leavers" metric group in a slicer.

Show Leavers Forecast =

```
IF(
    SELECTEDVALUE('Metric Group Selector'[MetricGroup]) = "Leavers",
    [Leavers Forecast],
    BLANK())
```

- Show New Employees Actual measure is used to dynamically display the New Employees measure only when the user selects the "New Employees" metric group in a slicer.

Show New Employees Actual =

```
IF(
    SELECTEDVALUE('Metric Group Selector'[MetricGroup]) = "New Employees",
    [New Employees],
    BLANK())
```

- Show New Employees Forecast measure is used to dynamically display the New Employees Forecast measure only when the user selects the „New Employees” metric group in a slicer.

Show New Employees Forecast =

```
IF(
    SELECTEDVALUE('Metric Group Selector'[MetricGroup]) = "New Employees",
    [New Employees Forecast],
    BLANK())
```

- ActualValue measure is used to dynamically display different KPIs (such as average age, median age, percentage of females, or percentage of males).

ActualValue =

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```
SWITCH(
    SELECTEDVALUE(HR_Targets[Metric]),
    "Age - average", [Age - average],
    "Age - median", [Age - median],
    "Female in %", [Female in %]*100,
    "Male in %", [Male in %]*100)
```

- Goal Achievement measure calculates the percentage of the target that has been achieved. It helps to assess how the actual value compares to the set goal.

Goal Achievement % =

$$DIVIDE([ActualValue], SELECTEDVALUE(HR_Targets[Target])) * 100$$

- Average Employment measure is used to calculate the average workforce size over time, considering only those employees who were actively employed on each date (their start date is before or on the date, and their exit date is either blank or after the date).

Average Employment =

$$AVERAGEX(VALUES('dim_date'[Date]),$$

$$CALCULATE(DISTINCTCOUNT(fact_employment[EmpID]),$$

$$FILTER(fact_employment,$$

$$fact_employment[StartDate] <= 'dim_date'[Date] \&\&$$

$$(\text{ISBLANK}(fact_employment[ExitDate]) ||$$

$$fact_employment[ExitDate] > 'dim_date'[Date])))$$

- Turnover Rate measure calculates the employee turnover rate by dividing the number of leavers by the average number of employees.

Turnover Rate =

$$DIVIDE([Leavers],$$

$$[Average\ Employment], 0)$$

- Involuntary Turnover measure counts the distinct number of employees who involuntarily left the company during a specified period, using the exit date relationship with the date dimension, and filters the data accordingly.

Inoluntary Turnover =
$$DIVIDE(CALCULATE($$

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```
DISTINCTCOUNT(fact_employment[EmpID]),
USERRELATIONSHIP(fact_employment[ExitDate], 'dim_date'[Date]),
FILTER(
    fact_employment,
    NOT ISBLANK(fact_employment[ExitDate]) &&
    fact_employment[ExitDate] >= MIN('dim_date'[Date]) &&
    fact_employment[ExitDate] <= MAX('dim_date'[Date]) &&
    fact_employment[Group of termination]="Involuntary"
)
),[Average Employment])
```

- Voluntary Turnover measure counts the distinct number of employees who voluntarily left the company during a specified period, using the exit date relationship with the date dimension, and filters the data accordingly.

```
Voluntary Turnover = DIVIDE(
CALCULATE(
    DISTINCTCOUNT(fact_employment[EmpID]),
    USERRELATIONSHIP(fact_employment[ExitDate], 'dim_date'[Date]),
    FILTER(
        fact_employment,
        NOT ISBLANK(fact_employment[ExitDate]) &&
        fact_employment[ExitDate] >= MIN('dim_date'[Date]) &&
        fact_employment[ExitDate] <= MAX('dim_date'[Date]) &&
        fact_employment[Group of termination]="Voluntary"
    )
)
),[Average Employment])
```

- Age - median measure calculates the median employee age by computing the age of each employee at a given date and then finding the median of those ages.

```
Age - median =
MEDIANX(
    dim_employee,
    DATEDIFF(dim_employee[DOB], MAX('dim_date'[Date]), YEAR))
```

- Age – average measure calculates the average employee age by computing each employee's age at the selected date and then averaging those ages.

```
Age- average =
AVERAGEX(
    dim_employee,
    DATEDIFF(dim_employee[DOB], MAX('dim_date'[Date]), YEAR))
```

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- Leavers YoY in % (quick measure) shows the percentage change in employee leavers compared to the same period in the previous year.

Leavers YoY in % =
`VAR __PREV_YEAR = CALCULATE([Leavers], DATEADD('dim_date'[Date], -1, YEAR))`
`RETURN`
`DIVIDE([Leavers] - __PREV_YEAR, __PREV_YEAR)`

- Leavers_YTD measure calculates the number of unique employees who exited the organization year-to-date, based on their exit dates.

Leavers_YTD =
`CALCULATE(`
`DISTINCTCOUNT(fact_employment[EmpID]),`
`USERRELATIONSHIP(fact_employment[ExitDate], 'dim_date'[Date]),`
`DATESYTD('dim_date'[Date]))`

- New Employees YoY in % (quick measure) shows the percentage change in new employees compared to the same period in the previous year.

New Employees YoY in % =
`VAR __PREV_YEAR = CALCULATE([New Employees], DATEADD('dim_date'[Date], -1, YEAR))`
`RETURN`
`DIVIDE([New Employees] - __PREV_YEAR, __PREV_YEAR)`

- New Employees_YTD measure calculates the number of unique new employees year-to-date, based on their start dates.

New Employees_YTD =
`CALCULATE(`
`DISTINCTCOUNT(fact_employment[EmpID]),`
`USERRELATIONSHIP(fact_employment[StartDate], 'dim_date'[Date]),`
`DATESYTD('dim_date'[Date]))`

- Turnover Rate YoY in % (quick measure) shows the percentage change in the employee turnover rate compared to the same period in the previous year.

Turnover Rate YoY in % =
`VAR __PREV_YEAR = CALCULATE([Turnover Rate], DATEADD('dim_date'[Date], -1, YEAR))`
`RETURN`
`DIVIDE([Turnover Rate] - __PREV_YEAR, __PREV_YEAR)`

5. Technical instructions

Roles and Permissions for HR Dashboard:

1. HR Director

Access Scope:

- Full access to all HR data across the organization;
- Strategic summaries on employment, turnover, gender parity, etc.

Permissions:

- Manage user roles and permissions for the dashboard;
- Define and modify KPIs and reporting scopes;
- Access detailed analyses and forecasts at the organizational level.

Purpose:

Lead HR strategy and monitor overall HR effectiveness.

2. HR Manager

Access Scope:

- Detailed data related to their own department;
- Information on employment within their area.

Permissions:

- View and filter data at the department level;
- Generate reports and analyses for their department;
- No access to data from other departments or the entire organization.

Purpose:

Make operational decisions and support department development based on data.