

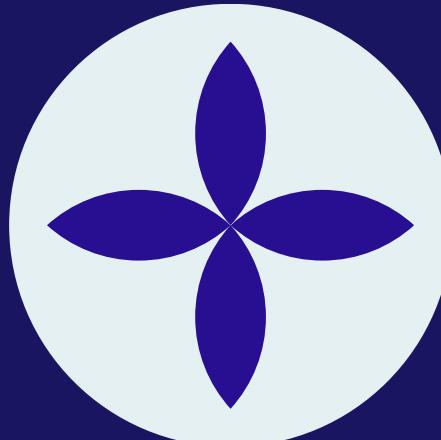


Employee Workload

Analysis Dashboard



Topics covered



Business Overview

Problem & Objective

Solution

Data Source

ER Diagram

Data Pipeline

AI Chatbot

MLOps

Conclusion

Business Overview

This project-based company, operating for around 4 years, uses Agile methodologies to maintain a lean workforce.

Collected Data

- Employee Data
- Organization Data
- Sprint Detail
- Project Data
- Workload Historical Data
- Employee Feedback

Business Problem

- High Turnover Rate
- Limited Data Collection



Objective

- Understand the factors contributing to employee turnover.
- Reduce the turnover rate through effective planning and strategies.

Solution



Dashboard

- Overall Human Resources
 - Turnover rate
 - Satisfaction rate (annual and per sprint)
 - Work performance (annual and per sprint)
 - Workload (annual and per sprint)



Machine Learning

- Topic Modeling
- Sentiment Analysis
- Potential Employee Churn



Chatbot

- Develop a Chatbot for workload management
- Collect feedback from employees.

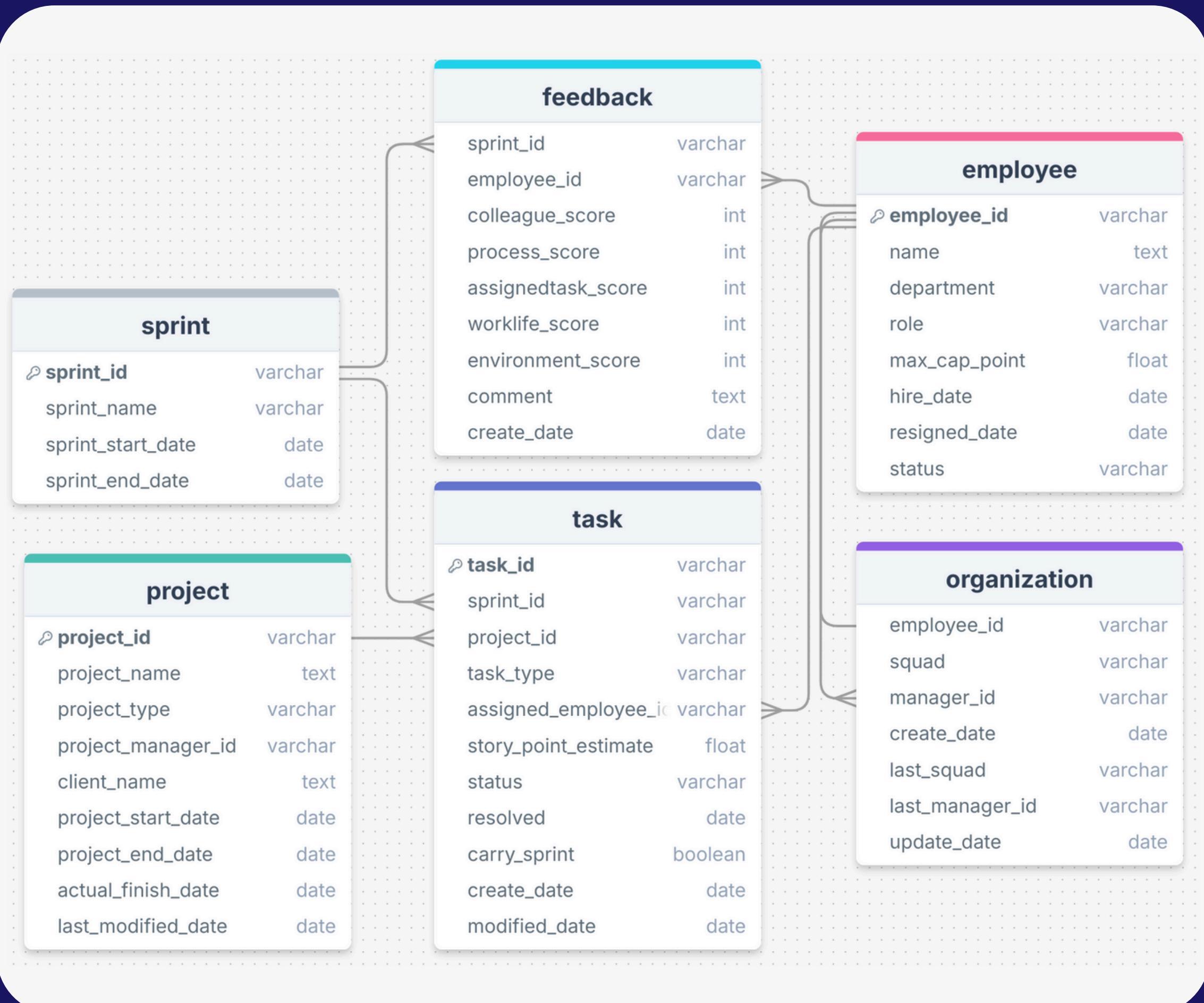
DATA SOURCE

Type of Data Source	Structured Data from Google Sheet
Storage	Cloud-based <ul style="list-style-type: none"> • File System : Google Drive • Data Lake : Google Cloud Storage • Data Warehouse : BigQuery
Format of the Data	File-based: CSV (URL Method)
Data Update Frequency	Batch : Data updated every sprint (2 weeks)
Data Retention	<ul style="list-style-type: none"> • Warm Storage : Active Project Data and Employee Data • Cold Storage : Completed Project and Task Data • Freeze Storage : After-Maintenance-Phase-End Data
Slowly Changing Dimension (SCD)	SCD Type 3

Example of
SCD Type 3 :

employee_id	squad	manager_id	create_date	last_squad	last_manager_id	update_date
EMP033	c	EMP034	1-Jan-2022	b	EMP019	1-Jan-2023
EMP034	c	EMP034	1-Jan-2022	null	null	null
EMP035	c	EMP034	1-Jan-2022	b	EMP019	1-Jan-2023
EMP036	c	EMP034	1-Jan-2022	b	EMP019	1-Jan-2023

ER diagram



- **Fact Table :**
 - `feedback` (update every sprint)
 - `task` (update every sprint)
- **Dimension Table :**
 - `employee`
 - `organization`
 - `sprint`
 - `project`
- **Type of Relationships**
 - **One-to-One (1:1)**
 - `employee_id` (`employee`: PK)
 - `employee_id` (`organization`: FK)
 - **One-to-Many (1:M)**
 - `employee_id` (`employee`: PK)
 - `manager_id` (`organization`: FK)
 - `employee_id` (`feedback`: FK)
 - `assigned_employee_id` (`task`: FK)
 - **sprint_id** (`sprint`: PK)
 - `sprint_id` (`feedback`: FK)
 - `sprint_id` (`task`: FK)
 - **project_id** (`project`: PK)
 - `project_id` (`task`: FK)

Feature Store

Task Features table

Feature	Description
bug_task_ratio	The number of bugs compared to total tasks for the employee
carry_sprint_per_year	The number of tasks carried over to the next sprint per year
carry_sprint_ratio	The number of tasks carried over to the next sprint compared to total tasks
completed_task_ratio	The number of tasks completed on time out of all tasks
task_to_team_ratio	The number of employee's tasks compared to the team's total tasks

Feature Store

Feedback Features table (1)

Feature	Description
avg_colleague_score	The average colleague score
avg_process_score	The average process score
avg_assignedtask_score	The average assigned task score
avg_worklife_score	The average work-life balance score
avg_environment_score	The average environment score

Feature Store

Feedback Features table (2)

Feature	Description
topic_1	The number of comments about topic 1
topic_2	The number of comments about topic 2
topic_3	The number of comments about topic 3
topic_4	The number of comments about topic 4
topic_5	The number of comments about topic 5
avg_sentiment_score	The average sentiment score
max_sentiment_score	The highest sentiment score
min_sentiment_score	The lowest sentiment score

Feature Store

Feedback Features table (3)

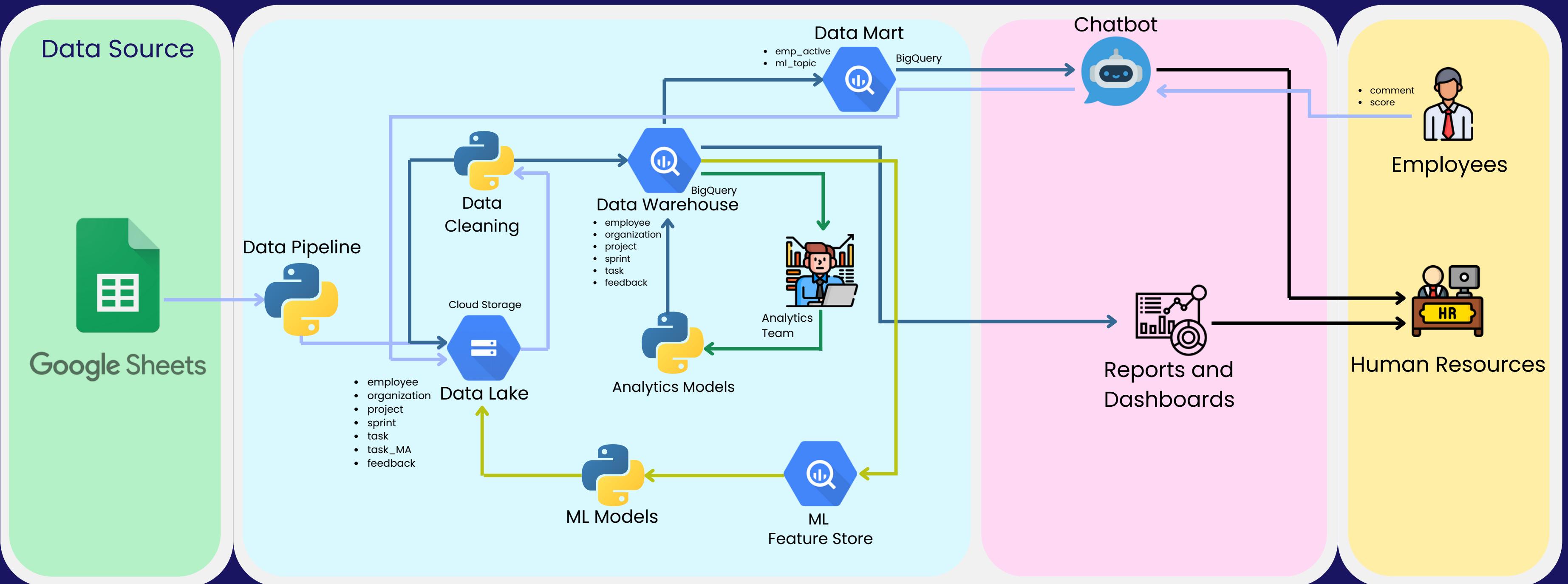
Feature	Description
topic_1_avg_sentiment	The average sentiment score ratio for topic 1
topic_2_avg_sentiment	The average sentiment score ratio for topic 2
topic_3_avg_sentiment	The average sentiment score ratio for topic 3
topic_4_avg_sentiment	The average sentiment score ratio for topic 4
topic_5_avg_sentiment	The average sentiment score ratio for topic 5

Feature Store

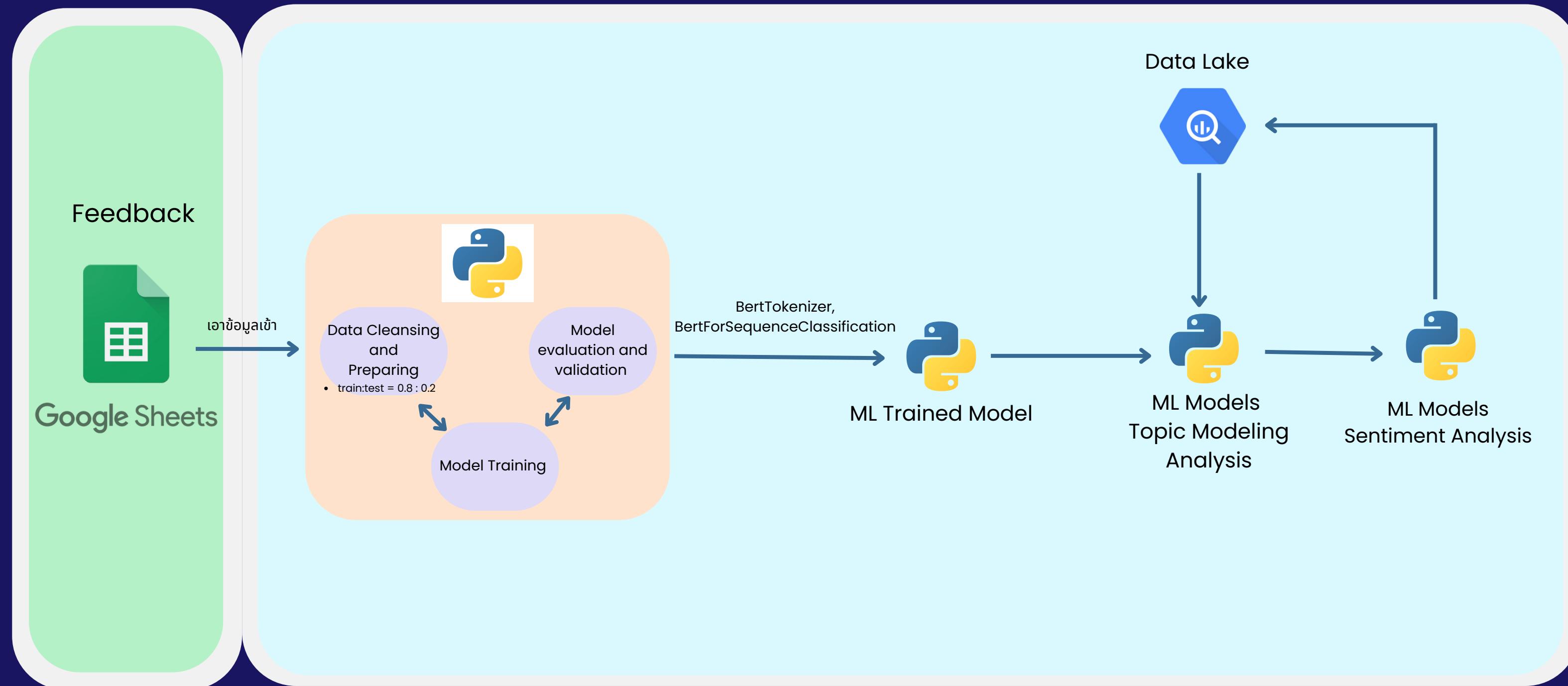
Employee Features table

Feature	Description
role	<p>The employee's job position (10 roles)</p> <ul style="list-style-type: none">• Senior Project Manager• Project Manager• Data Engineer• Data Scientist• Software Engineer• DevOps Engineer• IT Support Specialist• Data Analyst• Data Visualization Specialist• QA Engineer
team_changing	Whether the employee has changed teams (1) or stayed in the same team (0).
year_of_work	The number of years the employee has worked at the company.
last_manager_id	the latest manager the employee has worked with

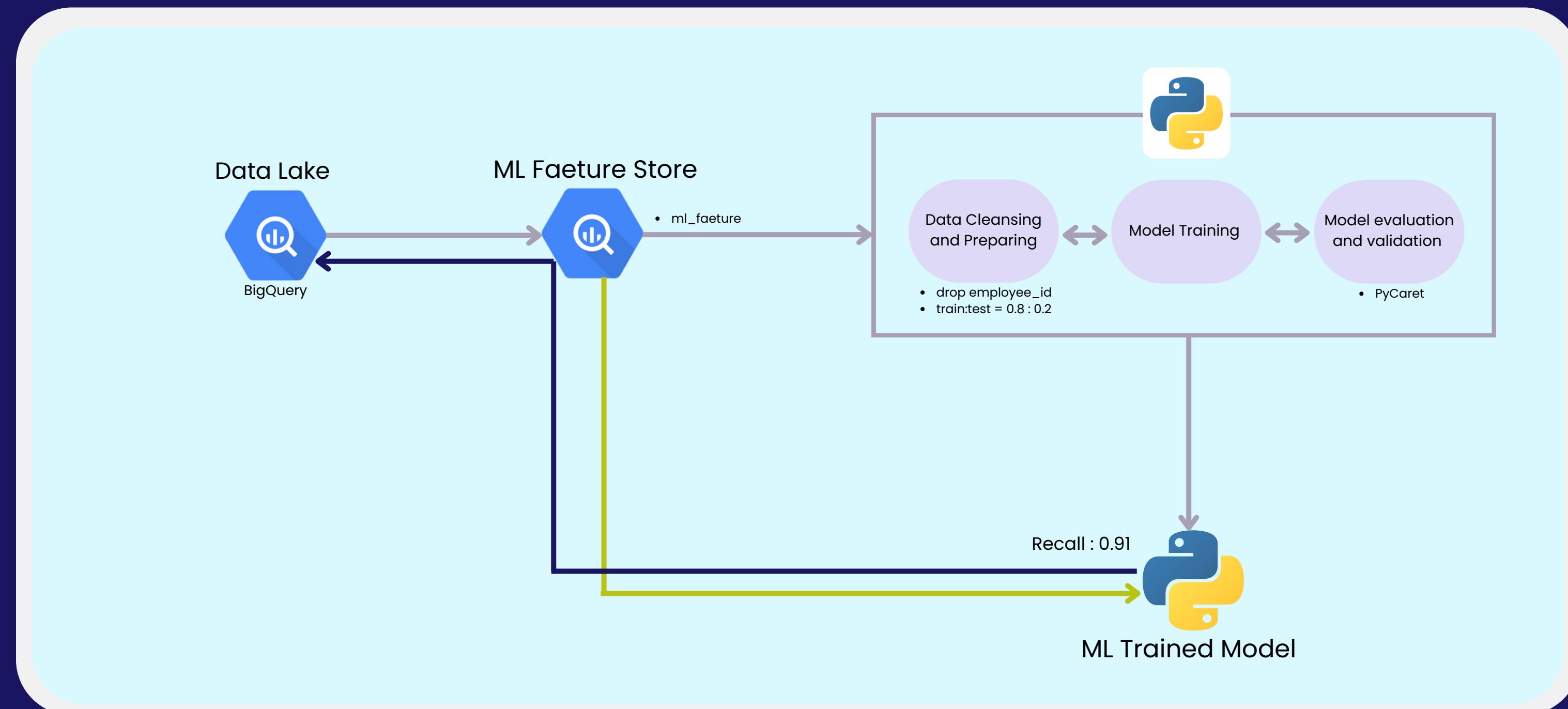
Data Pipeline



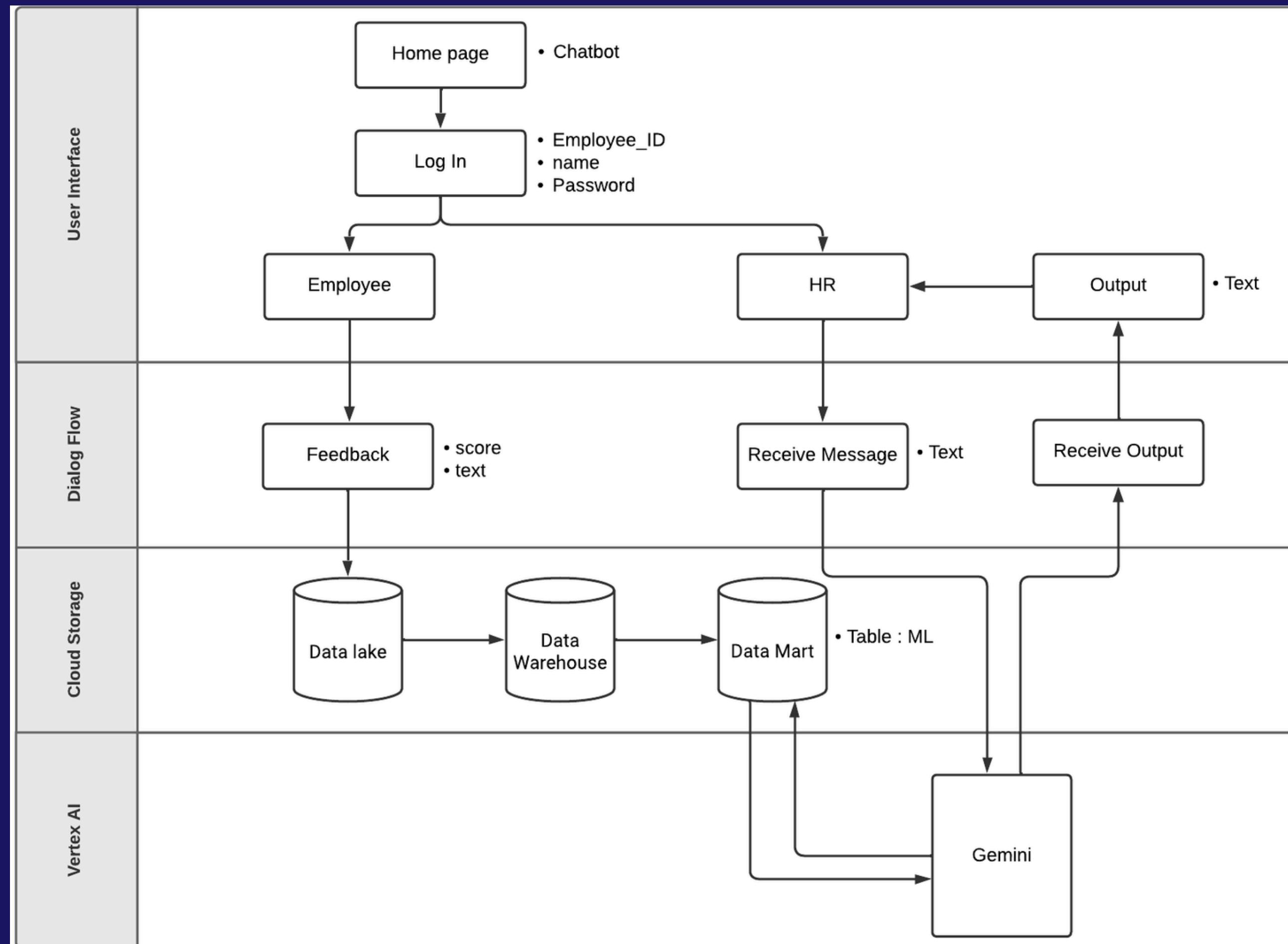
MLOps Pipeline - Topic Modeling & Sentiment Analysis



MLOps Pipeline - Churn Prediction



AI Chatbot

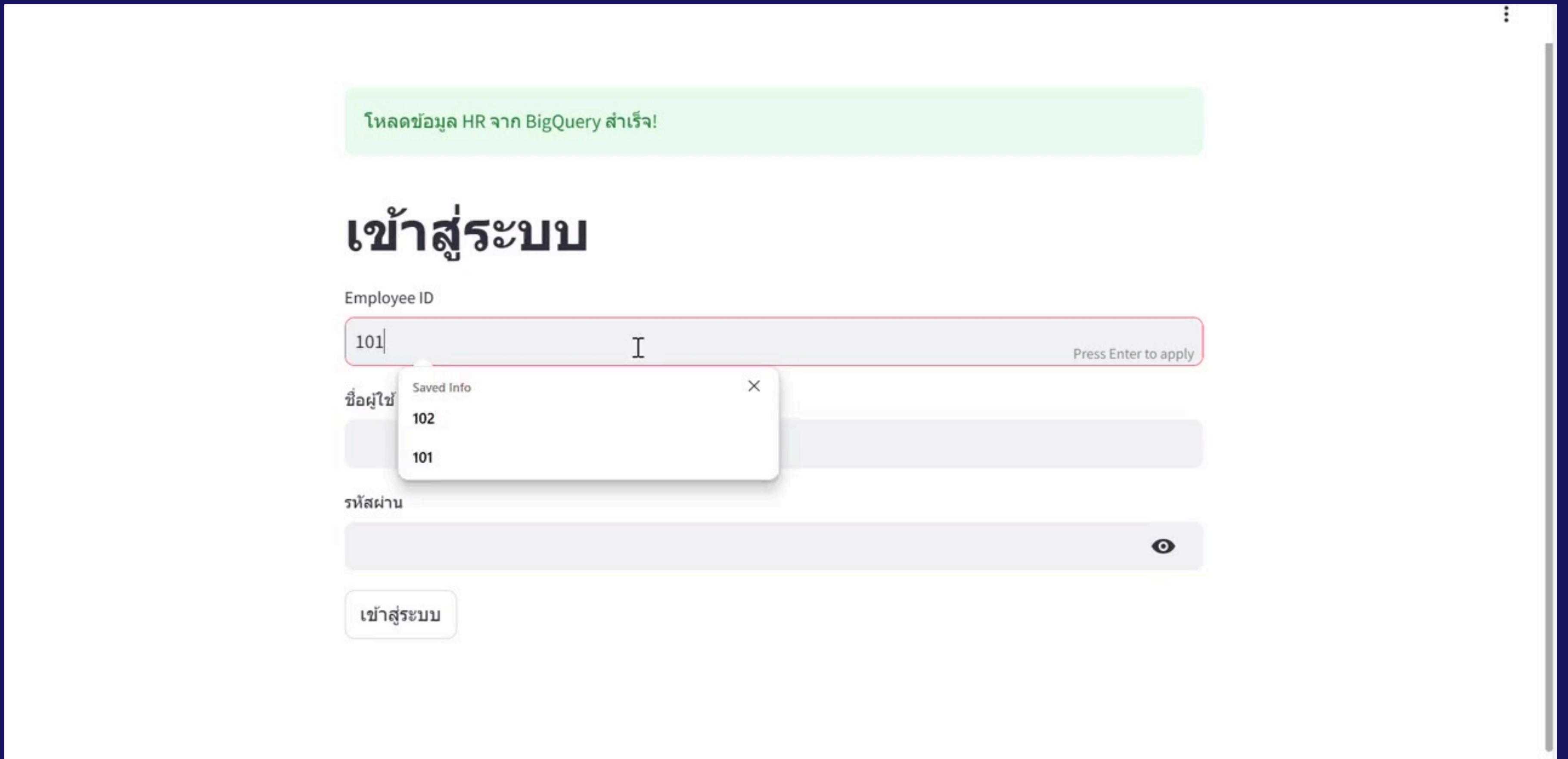


AI Chatbot



Chatbot Table : ML	Feature	Description	Answer
Chatbot Table : ML	emp_active	employee data and machine learning analysis results	<ul style="list-style-type: none">• summaries,• numerical rankings• brief explanations• analysis
	ml_topic	topic modeling analysis results	

AI Chatbot



AI Chatbot

Welcome, user1

บทบาทของคุณ: พนักงาน

ออกจากระบบ

เลือก Sprint ID
001

ใน sprint ที่ผ่านมา คุณมีความสุขกับเพื่อนร่วมงานแค่ไหน? (1 น้อย - 5 มาก)

เลือกคะแนนสำหรับ colleague
 1 2 3 4 5

ใน sprint ที่ผ่านมา คุณมีความสุขกับกระบวนการทำงานแค่ไหน? (1 น้อย - 5 มาก)

เลือกคะแนนสำหรับ process
 1 2 3 4 5

ใน sprint ที่ผ่านมา คุณมีความสุขกับงานที่ได้รับมอบหมายแค่ไหน? (1 น้อย - 5 มาก)

เลือกคะแนนสำหรับ task
 1 2 3 4 5

ใน sprint ที่ผ่านมา คุณมีความสุขกับ work-life balance แค่ไหน? (1 น้อย - 5 มาก)

เลือกคะแนนสำหรับ work_life_balance
 1 2 3 4 5

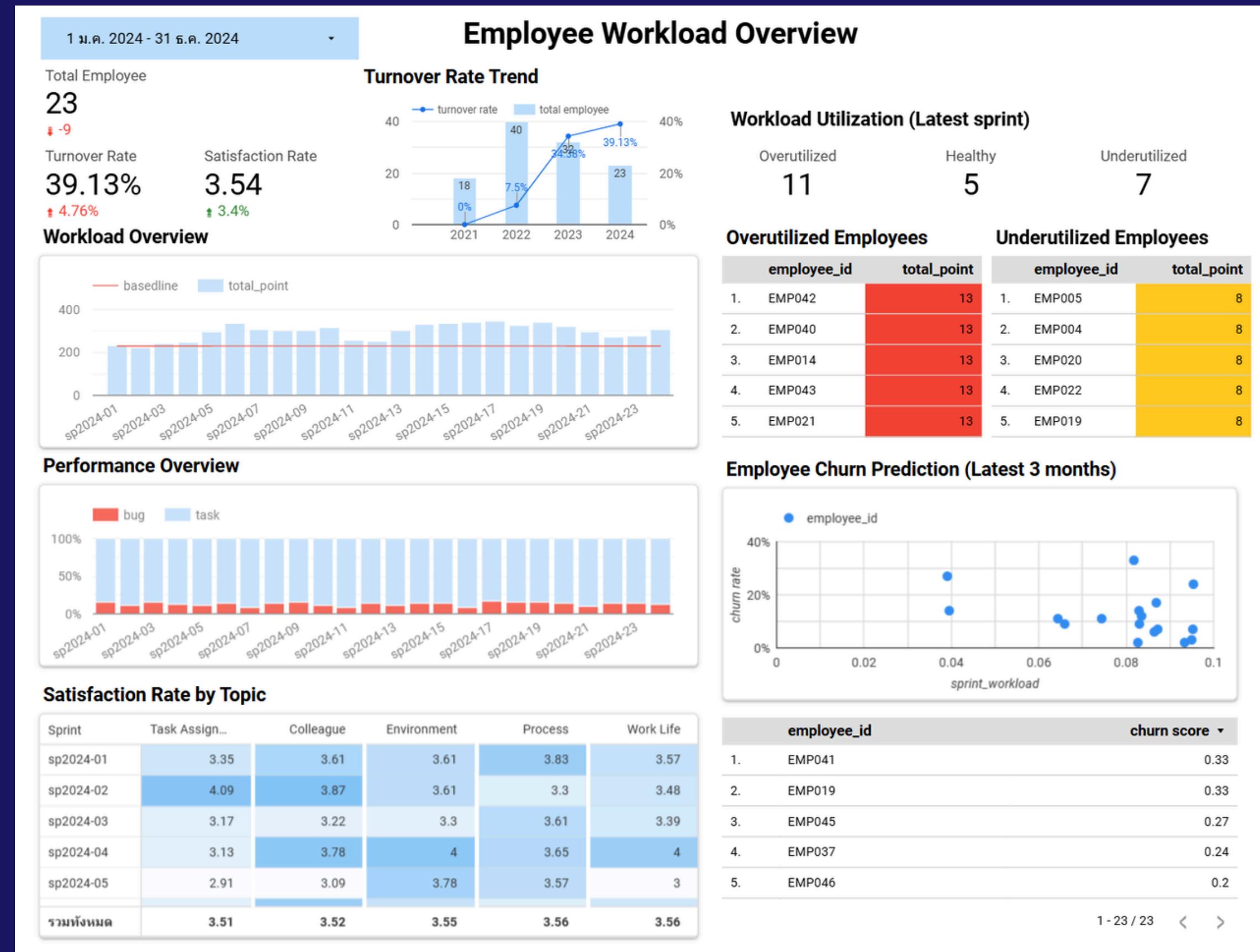
ใน sprint ที่ผ่านมา คุณมีความสุขกับบรรยากาศในการทำงานแค่ไหน? (1 น้อย - 5 มาก)

เลือกคะแนนสำหรับ work_environment
 1 2 3 4 5

ความคิดเห็นเพิ่มเติม (ถ้ามี)

ส่ง Feedback

Dashboard



CONCLUSION

- The company can strategically address its high turnover rate and create a more supportive work environment.
- This will help the organization achieve its goal of operating efficiently with a small but highly capable workforce, ensuring long-term success.

FUTURE WORK

Data Collection	<ul style="list-style-type: none">• Leave and Absenteeism• Job Details with Promotion• Performance and Productivity Data• Financial Data (Related to Employees)
ML	<ul style="list-style-type: none">• Classification: Explore additional topics to better understand employee behaviour.
ChatBot	<ul style="list-style-type: none">• Alert Features• Auto Report Generation

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