

Specifications for the RAG Agent Queries

Supported Query Types

0.1 KPI Query with Information from the Knowledge Base (KB)

The agent should be able to access the Knowledge Base to provide contextual information about KPIs and machines, such as definitions, purposes, and calculation methods.

Example Queries:

- “What is the KPI `kpi_name`?”
- “Describe the machine `machine_name`.”

Response: Provides descriptive information about the KPI or machine, extracted from the Knowledge Base.

0.2 Value of a Specific KPI for a Machine on a Specific Day

Returns the value of the KPI for a given machine on a specific day.

Sent Parameters:

- `kpi_name` (string): Name of the KPI.
- `machine_name` (string): Name of the machine.
- `start_range` (string, format YYYY-MM-DD): Requested date.

Received Parameters:

- `kpi_name` (string): Name of the KPI.
- `machine_name` (string): Name of the machine.
- `start_range` (string, format YYYY-MM-DD): Requested date.
- `value` (number): Value calculated by the KPI engine.
- `unit` (string): Unit of measurement of the KPI.

Example Requests:

- “What is the value of KPI `kpi_name` for machine `machine_name` on `date`?”
- “Show me the latest value of KPI `kpi_name` for machine `machine_name`.”

0.3 Values of a KPI for a Machine over a Specific Time Period

Returns the trend of a KPI for a machine over a specified time interval (weekly, monthly).

Sent Parameters:

- `kpi_name` (string): Name of the KPI.
- `machine_name` (string): Name of the machine.
- `start_date` (string, format YYYY-MM-DD): Start date.
- `end_date` (string, format YYYY-MM-DD): End date.

Received Parameters:

- `kpi_name` (string): Name of the KPI.
- `machine_name` (string): Name of the machine.
- `start_date` (string, format YYYY-MM-DD): Start date.
- `end_date` (string, format YYYY-MM-DD): End date.
- `values` (tuple): Pairs consisting of a date and the corresponding value calculated by the KPI engine.
- `unit` (string): Unit of measurement of the KPI.

Example Requests:

- “What is the value of KPI `kpi_name` for machine `machine_name` in the month of `time_period`?”
- “What is the trend of KPI `kpi_name` for `machine_name` in the last week?”

Details:

- **Week/Month:** Returns daily average values for each day in the period.

0.4 Aggregated Function on a KPI for a Machine

Calculates an aggregated function (sum, average, maximum, minimum) for a KPI, related to a machine over a specific time interval.

Sent Parameters:

- `kpi_name` (string): Name of the KPI.
- `operation` (string): Type of aggregation (`sum`, `avg`, `max`, `min`).
- `machine_names` (list, optional): Name of the machine.
- `start_date` (string, format YYYY-MM-DD): Start date.
- `end_date` (string, format YYYY-MM-DD): End date.
- `aggregation` (weekly or monthly, optional): Whether the query requires aggregated values with weekly/monthly frequency over the selected time period.

Received Parameters:

- `kpi_name` (string): Name of the KPI.
- `operation` (string): Type of aggregation (`sum`, `avg`, `max`, `min`).
- `machine_names` (list, optional): Name of the machine.
- `start_date` (string, format YYYY-MM-DD): Start date.
- `end_date` (string, format YYYY-MM-DD): End date.
- Either:
 - `value` (number): Value calculated by the KPI engine.
 - `values` (tuple): Pairs consisting of a date and the corresponding value calculated by the KPI engine.
- `unit` (string)

Example Requests:

- “What is the maximum value of KPI `kpi_name` for machine `machine_name` in the month of `time_period`?”

- “What is the weekly maximum value of KPI `kpi_name` for machine `machine_name` in the month of `time_period`?”

Aggregation Details:

- If 'aggregation' is not specified: returns a single value over the requested time period.
- If 'aggregation' is specified: returns a set of values (weekly or monthly) over the requested time period.

0.5 Generation of Dashboards or Reports

The results obtained from queries 3 and 4 can be visualized in the form of a dashboard. Alternatively, a summary report of the data can be generated, which specifies:

- **Overall Trends:** Identify key trends or patterns in the provided data.
- **Anomalies or Outliers:** Highlight any unexpected or significant deviations.
- **Comparative Analysis:** Compare different aspects of the data, where applicable.
- **Key Performance Metrics:** Summarize critical metrics, such as peaks, averages, or totals.

Final Considerations

- Currently, to receive information, it is always necessary to specify the machine for which a KPI is to be calculated. The model can handle only one question per KPI and machine at a time.
- Integration with topic 6 for dashboard visualization and for generating a downloadable report in PDF format is still in progress, but it is one of the upcoming goals.