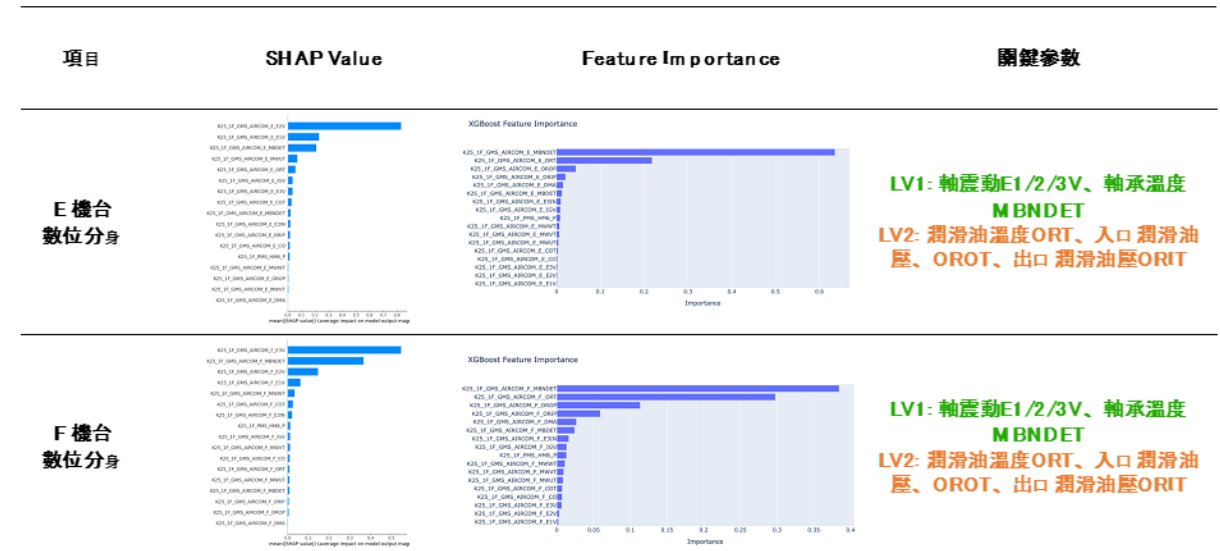
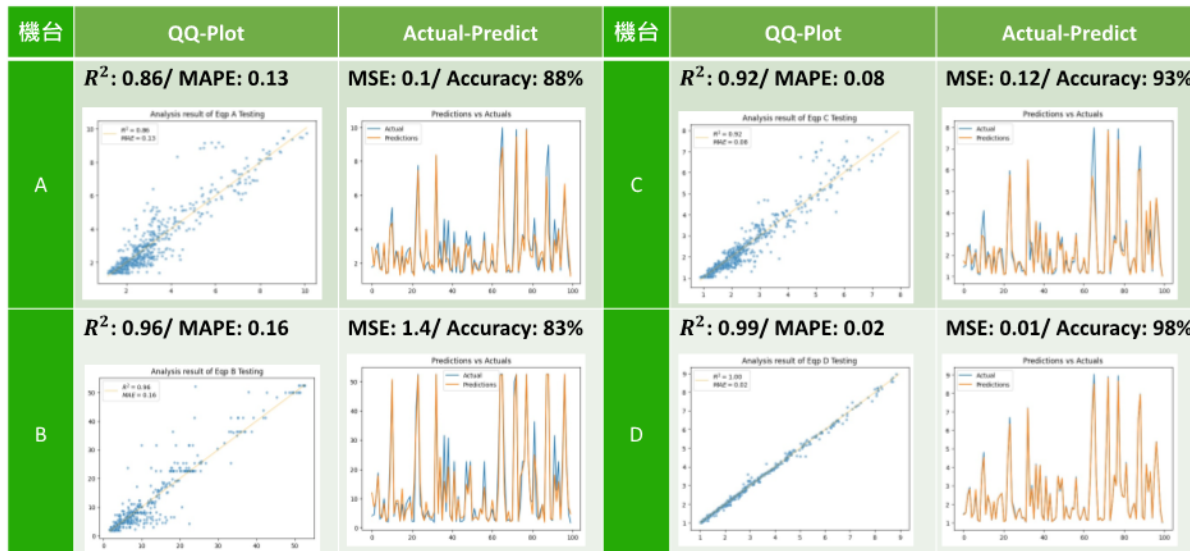


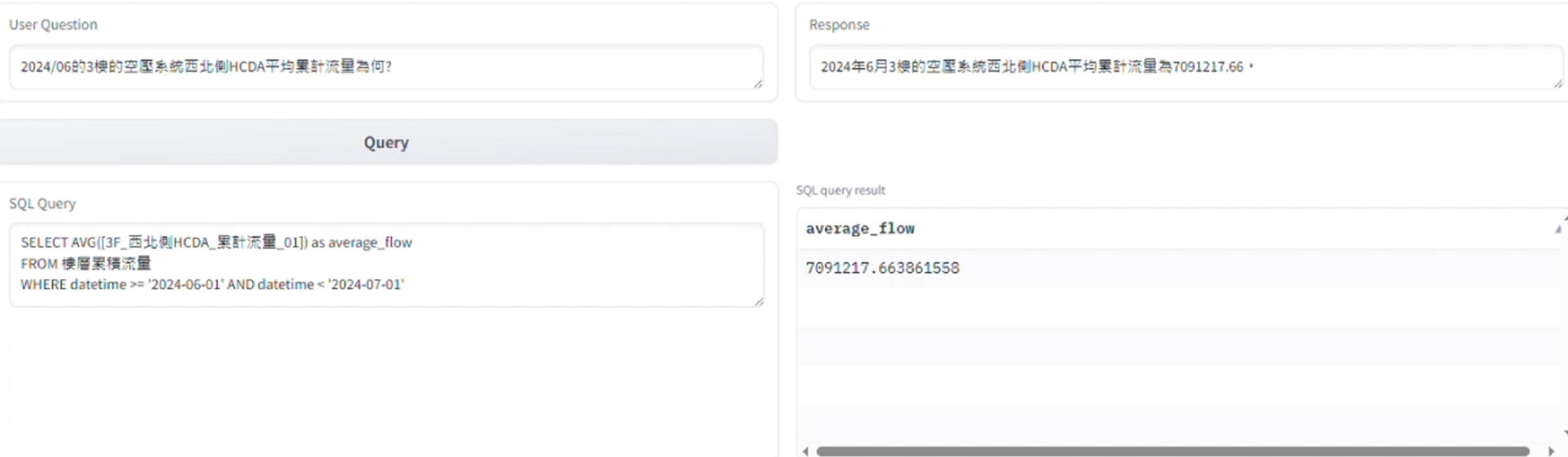
LLM Digital Twins for Air Compressor Energy Optimization

- Using AI digital twin models to predict KPI performance, we assist in decision-making for backup machine selection to achieve energy savings and optimize efficiency → By inputting machine parameters, the current KPI value can be predicted, allowing the selection of the most efficient machine for operation.
- Through explainable AI, we analyze parameters related to KPI and energy consumption, identifying which factors should be prioritized and adjusted when efficiency decreases → It was discovered that air compressor efficiency is strongly correlated with its bearings, emphasizing the importance of predictive maintenance (PHM) for bearings in the future.



LLM Digital Twins for Air Compressor Energy Optimization

- A data dashboard is provided to visualize the relationship between demand and supply data → This improves the speed and accuracy of information delivery, aiding real-time decision-making and responsiveness.
- Through LLM question-and-answer capabilities, users can directly understand the current data status on-site → By using LLM Agents, communication with Digital Twins is quick, effective, and intuitive.



The screenshot displays a user interface for an LLM-powered system. It is divided into four main sections:

- User Question:** A text input field containing the question: "2024/06的3樓的空壓系統西北側HCDA平均累計流量為何?"
- Response:** A text output field containing the answer: "2024年6月3樓的空壓系統西北側HCDA平均累計流量為7091217.66"
- Query:** A button labeled "Query" that triggers the generation of a SQL query.
- SQL Query:** A text area showing the generated SQL query:

```
SELECT AVG([3F_西北側HCDA_累計流量_01]) as average_flow  
FROM 樓層累積流量  
WHERE datetime >= '2024-06-01' AND datetime < '2024-07-01'
```
- SQL query result:** A table displaying the result of the query. The table has one column named "average_flow" and one row with the value "7091217.663861558".

average_flow
7091217.663861558