

Enhancing Business Analytics through LLM-SQL Integration

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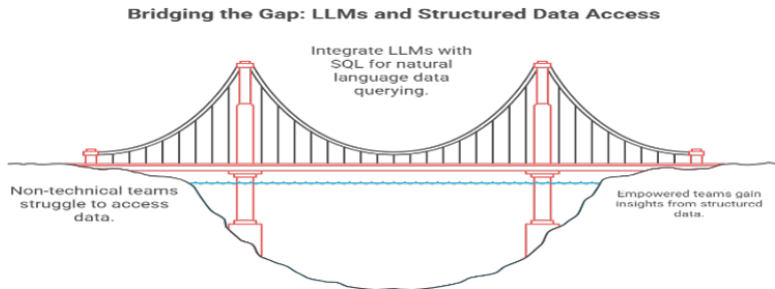
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Introduction

- Most business data is structured (e.g., P&L)
- Non-technical teams struggle with SQL access
- LLMs excel at language, not table logic
- Analysts are often needed for simple queries
- Delays in insight lead to slower decisions
- We aim to build a bridge: **chat** → **SQL**



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Objective

- Build a natural language-driven finance Q&A tool
- Convert user questions into structured SQL
- Ingest P&L, balance sheets as inputs
- Return human-readable answers with insights
- No SQL/BI knowledge required from users
- Unlock real-time access to performance metrics

Scope and Limitations

- Focused on financial statements and KPIs
- Inputs are structured (P&L, balance sheets)
- Supports performance-based natural questions
- Extendable to HR, sales, ops domains
- *Limitation: Relies on defined schema structure*

To develop an LLM-powered interface that answers natural language questions about financial data using SQL reasoning.

- LLMs struggle with structured data reasoning
- Schema mapping and SQL generation are difficult
- Answers must be accurate and explainable
- Assumes clean, labeled relational database schema

Input, Technique, and Output

- **Input:**

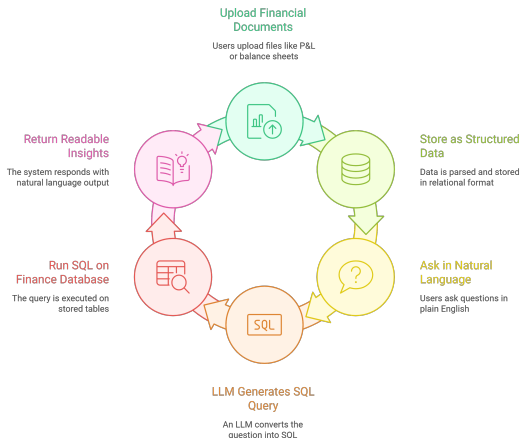
- P&L, balance sheets (relational DB)
- User provides natural language question

- **Technique:**

- Few-shot prompting (GPT-4)

- **Output:**

- Executed SQL + human-readable summary



Financial Data Analysis Cycle

- Extend support to unstructured financial documents
- Integrate visual dashboards with auto-generated charts
- Add multilingual support
- Expand to sales, HR, and operations domains