

Project Design Phase-II
Solution Requirements (Functional & Non-functional)

Date	27 February 2026
Team ID	LTVIP2026TMIDS90853
Project Name	Intelligent SQL Querying with LLMs Using Gemini Pro
Maximum Marks	4 Marks

Functional Requirements:

Following are the functional requirements of the proposed solution.

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	User Registration	- Registration through Form (Email & Password)- Registration through Gmail- Registration through LinkedIn
FR-2	User Confirmation	- Confirmation via Email Link- Confirmation via OTP Verification
FR-3	User Login & Authentication	- Login using Email & Password- Login through Gmail- Forgot Password & Reset Option- Secure Session Management
FR-4	Natural Language to SQL Generation	- User can enter natural language query- System generates SQL query using Gemini Pro API- Validate generated SQL query- Display generated SQL to user
FR-5	Database Integration	- Connect to MySQL/PostgreSQL database- Execute generated SQL queries- Display query results in table format
FR-6	File Upload & Schema Understanding	- Upload database schema in PDF format- Extract table structure from uploaded file- Use schema context for accurate SQL generation
FR-7	Dashboard & User Interface	- User dashboard after login- Query history display- Download SQL query as .sql file
FR-8	Error Handling & Validation	- Input validation for empty/invalid queries- Display meaningful error messages- Handle API errors gracefully
FR-9	Performance & Security	- API response time under 3 seconds- Secure API key storage- Data encryption and user authentication

Non-functional Requirements:

Following are the non-functional requirements of the proposed solution.

NFR No.	Non-Functional Requirement	Description
NFR-1	Usability	The system must have a simple, user-friendly interface that allows non-technical users to easily enter natural language queries and generate SQL without prior technical knowledge. Navigation should be intuitive and responsive across devices.
NFR-2	Security	The system must ensure secure authentication and authorization. API keys must be securely stored. User passwords should be encrypted. The application must prevent SQL injection, unauthorized access, and data breaches.
NFR-3	Reliability	The system should consistently generate accurate SQL queries with minimal errors. It must handle failures gracefully and provide meaningful error messages without crashing.
NFR-4	Performance	The system should generate SQL queries within 3 seconds under normal load conditions. It should handle multiple simultaneous users without significant delay.
NFR-5	Availability	The application should be available 99% uptime, ensuring users can access the system without interruptions. Proper monitoring and backup mechanisms should be in place.
NFR-6	Scalability	The system should support increasing numbers of users and database sizes. It must be deployable on cloud infrastructure to handle scaling requirements efficiently.