SYSTEM DESIGN AND ARCHITECTURE - INTERMEDIATE REVIEW

92310133016

1. Introduction

System design and architecture play a crucial role in developing a reliable, scalable, and maintainable software solution. At the intermediate stage of review, the goal is to ensure that the proposed system structure aligns with project objectives, user requirements, and available resources.

The review also allows the development team to identify potential risks early, evaluate the feasibility of chosen technologies, and refine workflows before moving into advanced implementation. A well-planned architecture reduces errors, avoids rework, and ensures that the system can grow and adapt in the future.

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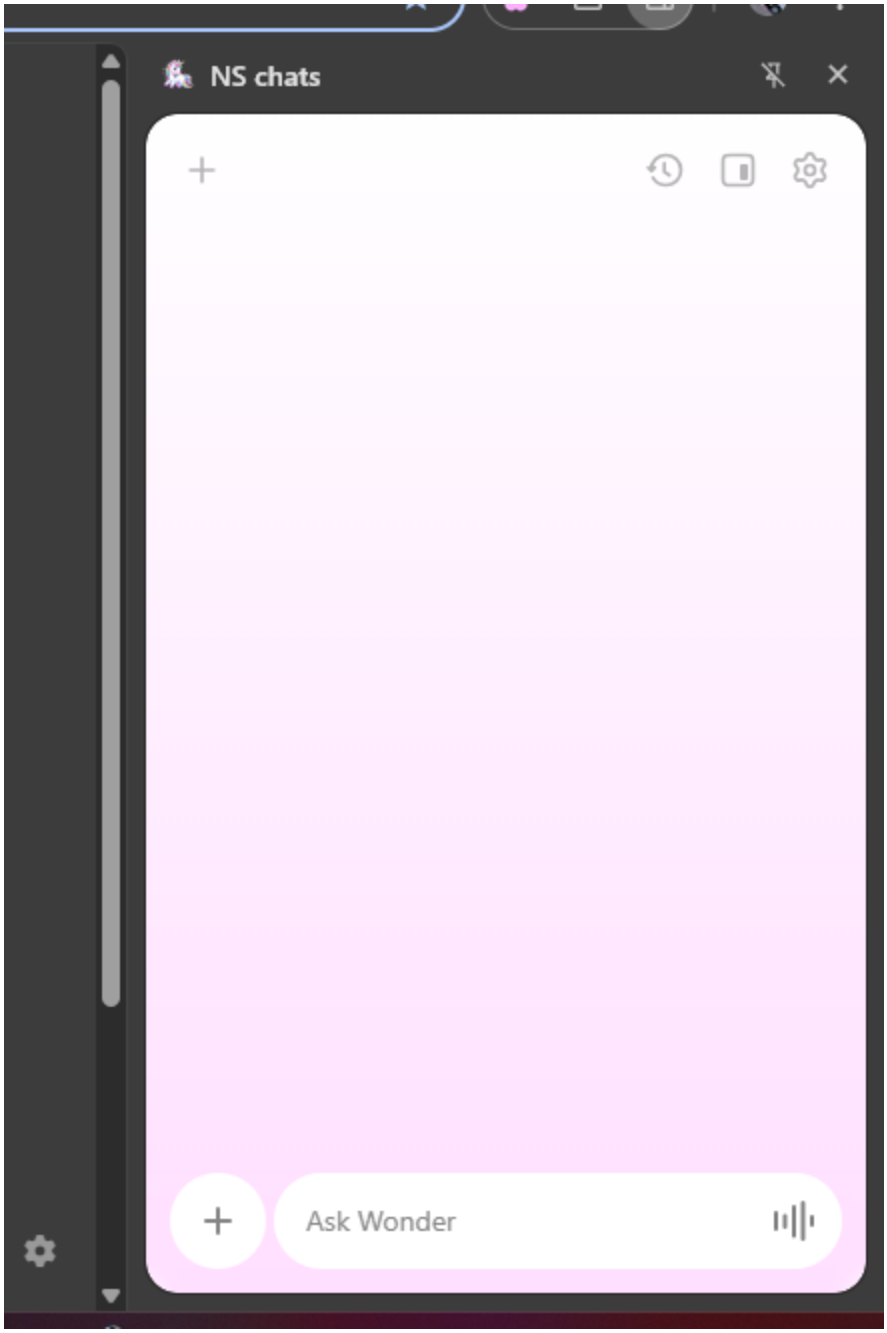

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2. System Overview

The proposed system is intended to provide an integrated platform where users can perform multiple tasks efficiently without relying on fragmented tools. The system architecture is modular, meaning each component can work independently while also supporting communication with other modules.

Key Features

- **Single Interface Access**: Users interact with the system through one interface rather than switching between multiple applications.
- **Automation of Tasks**: Repetitive operations, such as data retrieval, notifications, and project tracking, are automated to save time.
- **Cross-Domain Integration**: The system can connect with external tools.
- **Scalability**: The architecture supports future growth, such as adding new modules or connecting to additional platforms.

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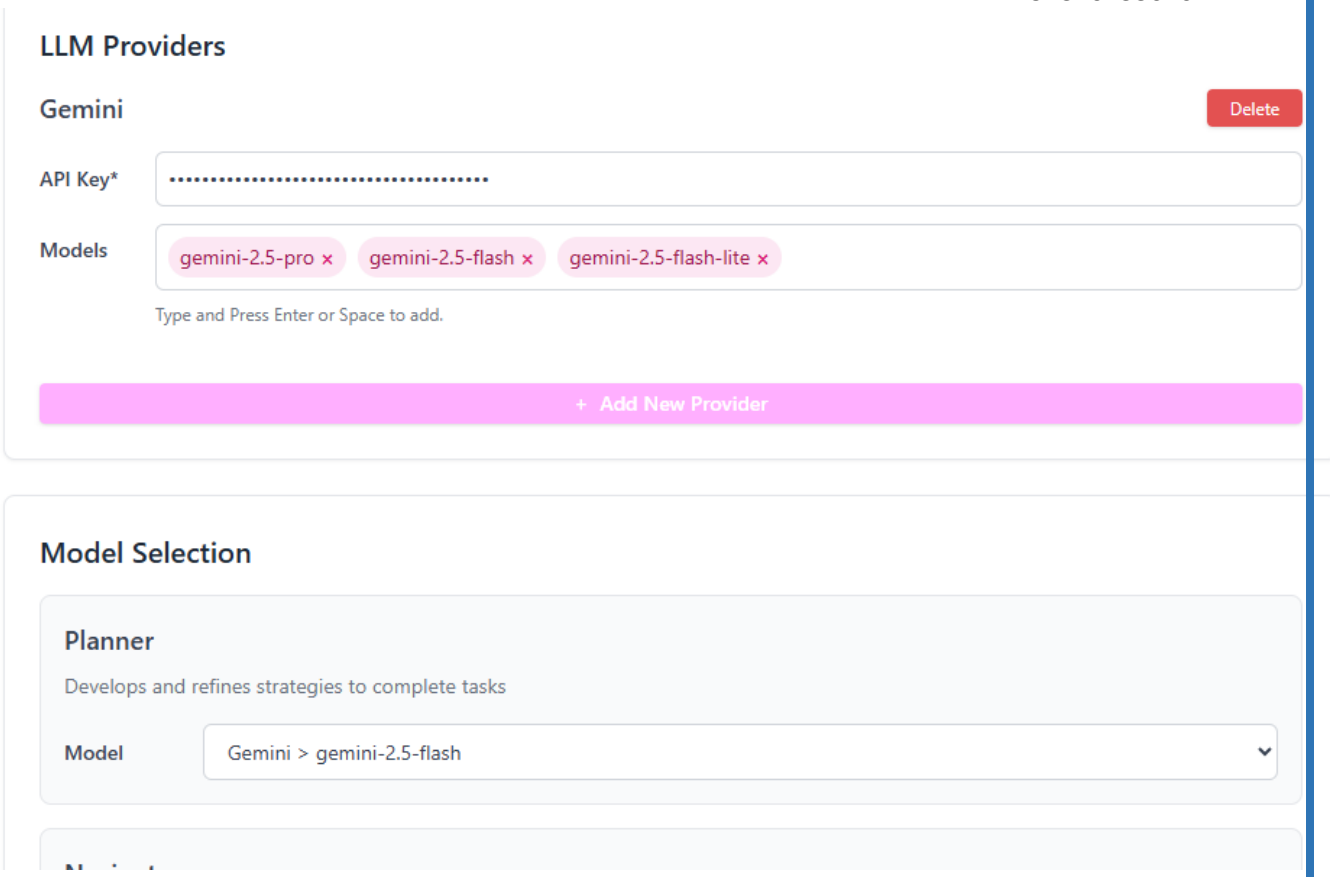

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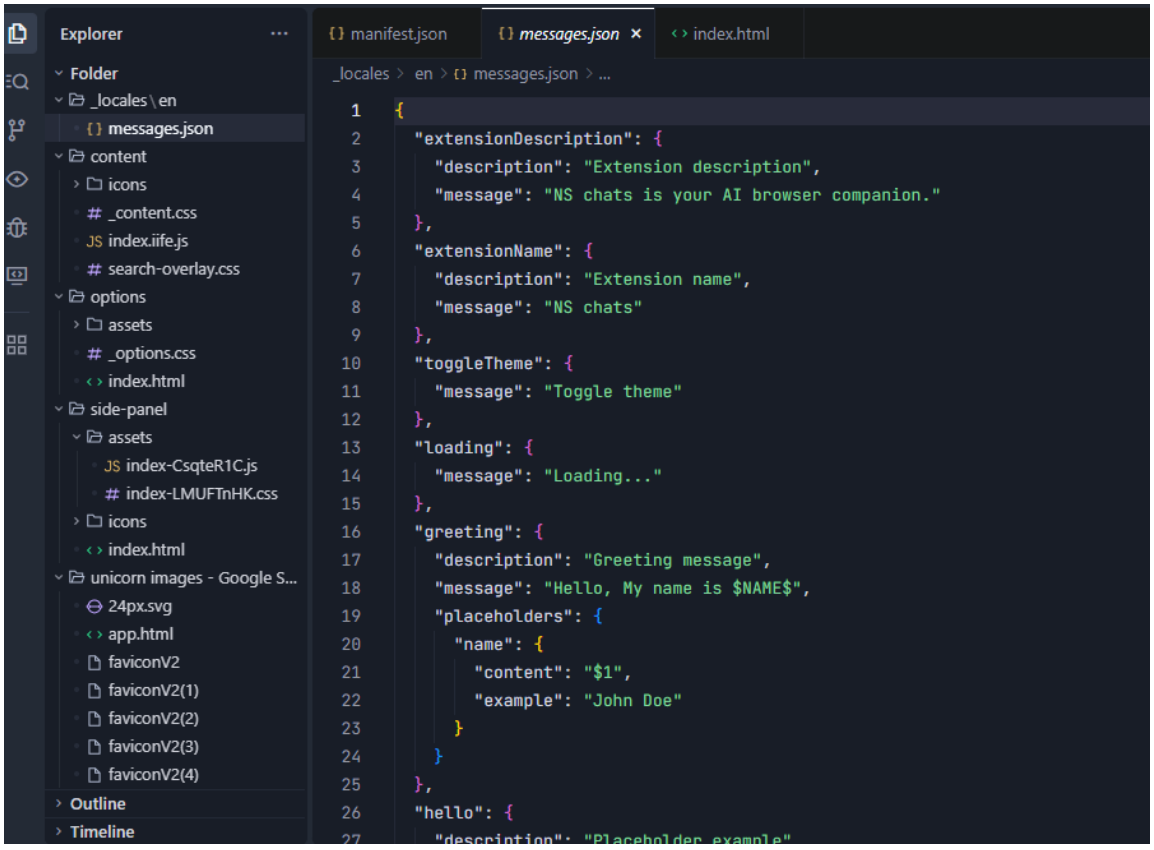

a. Architectural Style

The system follows a **layered architecture** consisting of:

1. **Presentation Layer** – The user interface (UI) where users interact with the system. This layer ensures simplicity and user-friendliness.
2. **Application Layer** – Handles logic, task scheduling, and workflows. This layer manages requests from users and coordinates between modules.
3. **Integration Layer** – Provides APIs and connectors to external services (e.g., GitHub, research platforms).
4. **Data Layer** – Stores user data, task details, and logs. Databases ensure secure and efficient storage of information.

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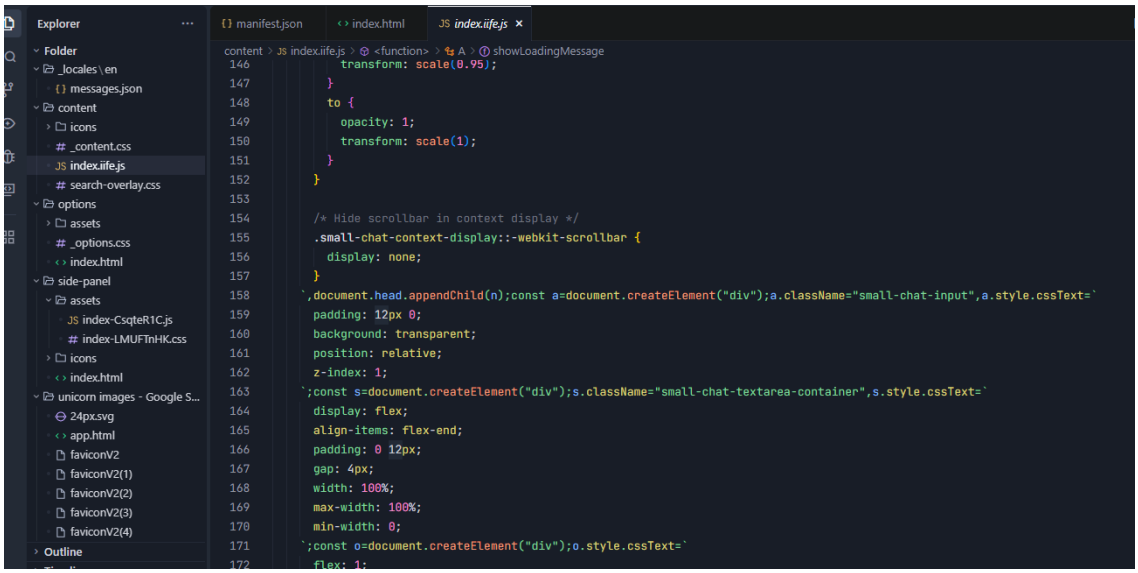
b. Workflow Example

- A user requests task automation.
- The application layer processes the request.
- The integration layer connects with the necessary platform.
- The data layer stores results, which are then shown back in the presentation layer.



4. Design Considerations

When designing the system, several factors are taken into account:

- **Usability**: The interface must be intuitive for students, researchers, and professionals.
- **Reliability**: Automated tasks should run smoothly with minimal errors.
- **Security**: Sensitive data must be protected using encryption and access control.
- **Performance**: The system must handle multiple tasks without delays.
- **Extensibility**: New features or modules should be added easily without redesigning the entire system.

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5. Intermediate Review Outcomes

The intermediate review stage has helped highlight:

- Strengths: modular design, cross-domain integration, and scalability.
- Challenges: ensuring strong security for multi-platform connections and optimizing performance for large data sets.
- Next Steps: refine system workflows, finalize integration with external APIs, and prepare detailed testing strategies.

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