OPENARCH - ECLIPSE
SOEN 6741 - Advanced Software Architecture

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1. INTRODUCTION

Eclipse is a powerful and versatile open-source Integrated Development Environment (IDE) that provides a comprehensive set of tools for software development across multiple programming languages and platforms.

2. DESIRABLE TRAITS

1. Layered Architecture:

Eclipse may employ a layered architecture, where different components and services are organized into layers, each responsible for specific functionalities
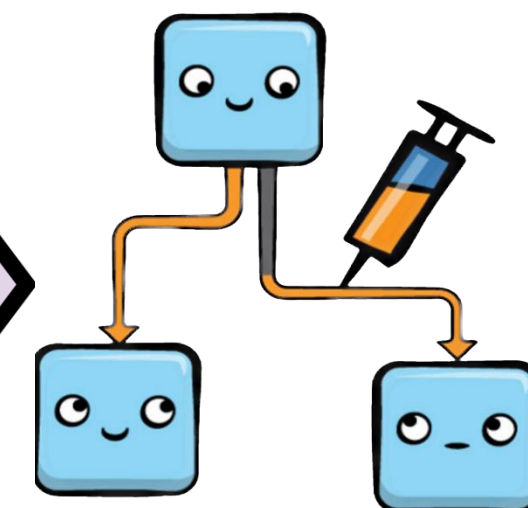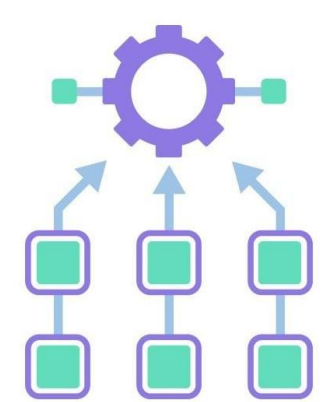
2. Separation of Concerns (SoC) Principle:

Eclipse emphasizes the separation of concerns, dividing the software system into distinct modules or plugins.

3. Dependency Injection and Inversion of Control:

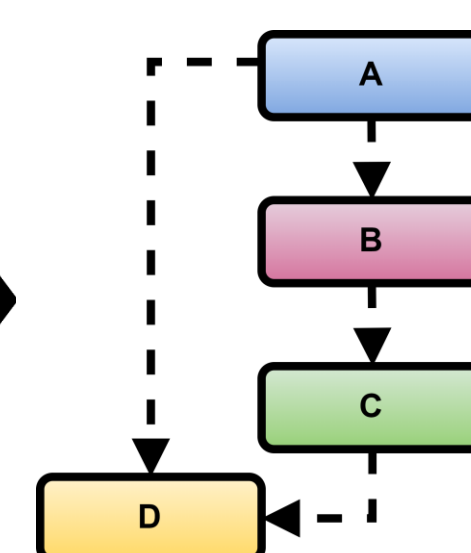These techniques facilitate loose coupling, testability, and flexibility in managing component dependencies.
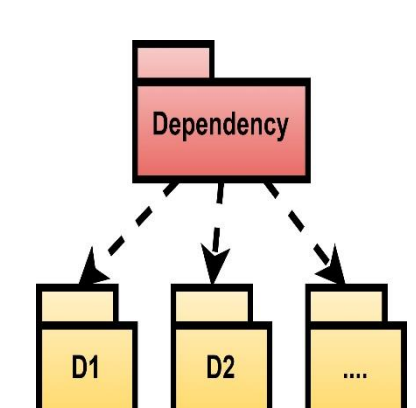
4. Event-Driven Architecture:

Eclipse follows an event-driven architecture, where various components and plugins can subscribe to and emit events.

5. Acyclic Dependency Principle (ADP):

In Eclipse, the dependencies between various components or modules are structured in such a way that no module depends on itself, directly or indirectly.
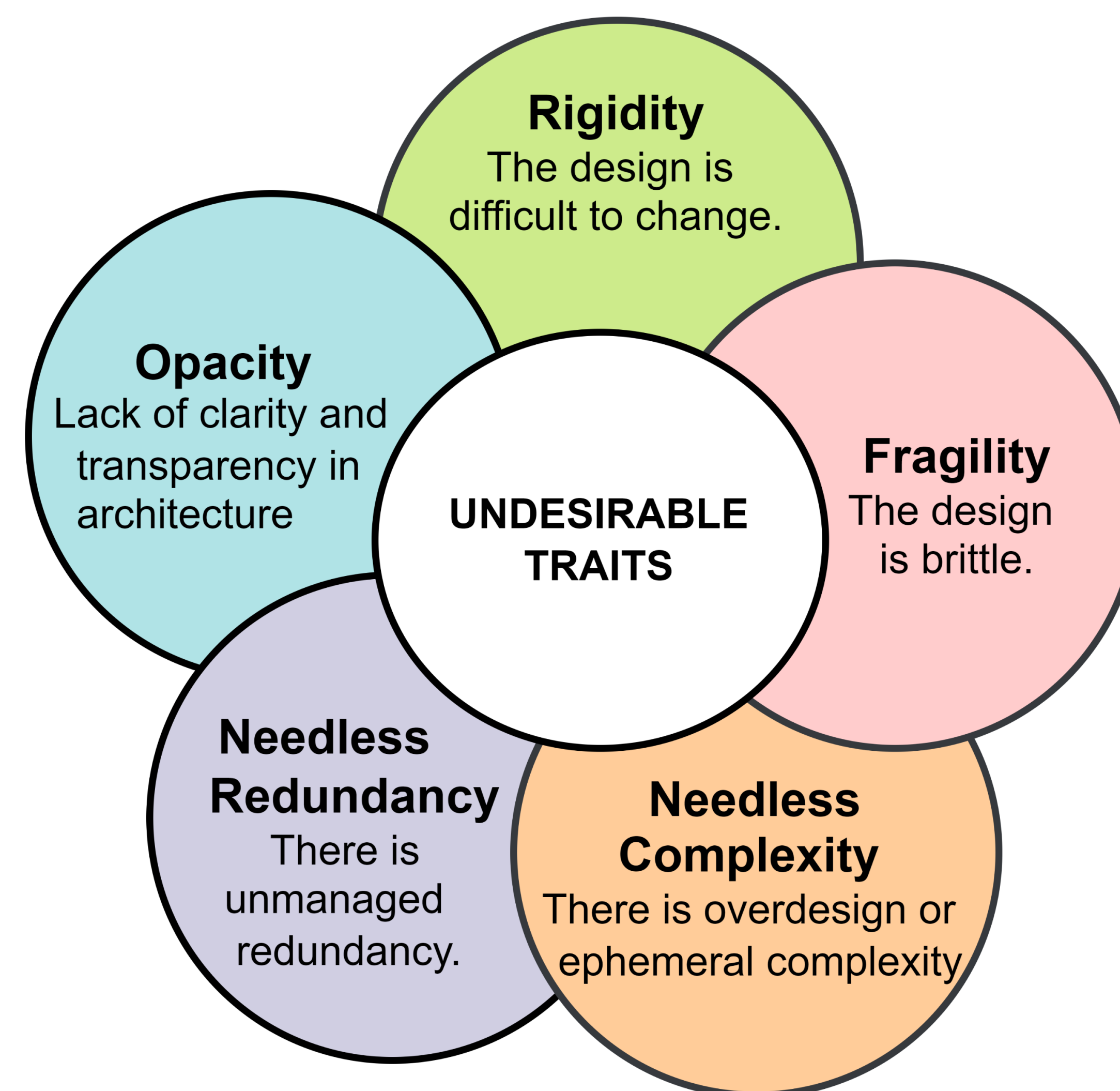
6. Stable Dependency Principle (SDP):

Most components or modules in Eclipse are designed to handle a specific responsibility, which aids in maintaining and evolving the system.

7. Open-Closed Principle (OCP):

This principle enable developers to extend functionality of Eclipse without modifying its existing codebase, ensuring stability, maintainability, and flexibility.

Existing Methods
New Methods

3. UNDESIRABLE TRAITS

Rigidity
The design is difficult to change.

Opacity
Lack of clarity and transparency in architecture

UNDESIRABLE TRAITS

Fragility
The design is brittle.

Needless Redundancy
There is unmanaged redundancy.

Needless Complexity
There is overdesign or ephemeral complexity

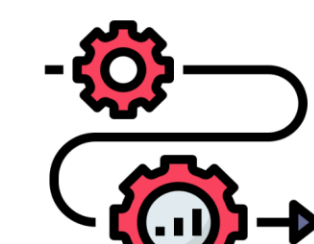## 3.1. USES OF UNDESIRABLE TRAITS

- IDENTIFICATION OF DESIGN ISSUES
- MAINTENANCE & EVOLUTION
- QUALITY ASSURANCE
- SCALABILITY
- COLLABORATION
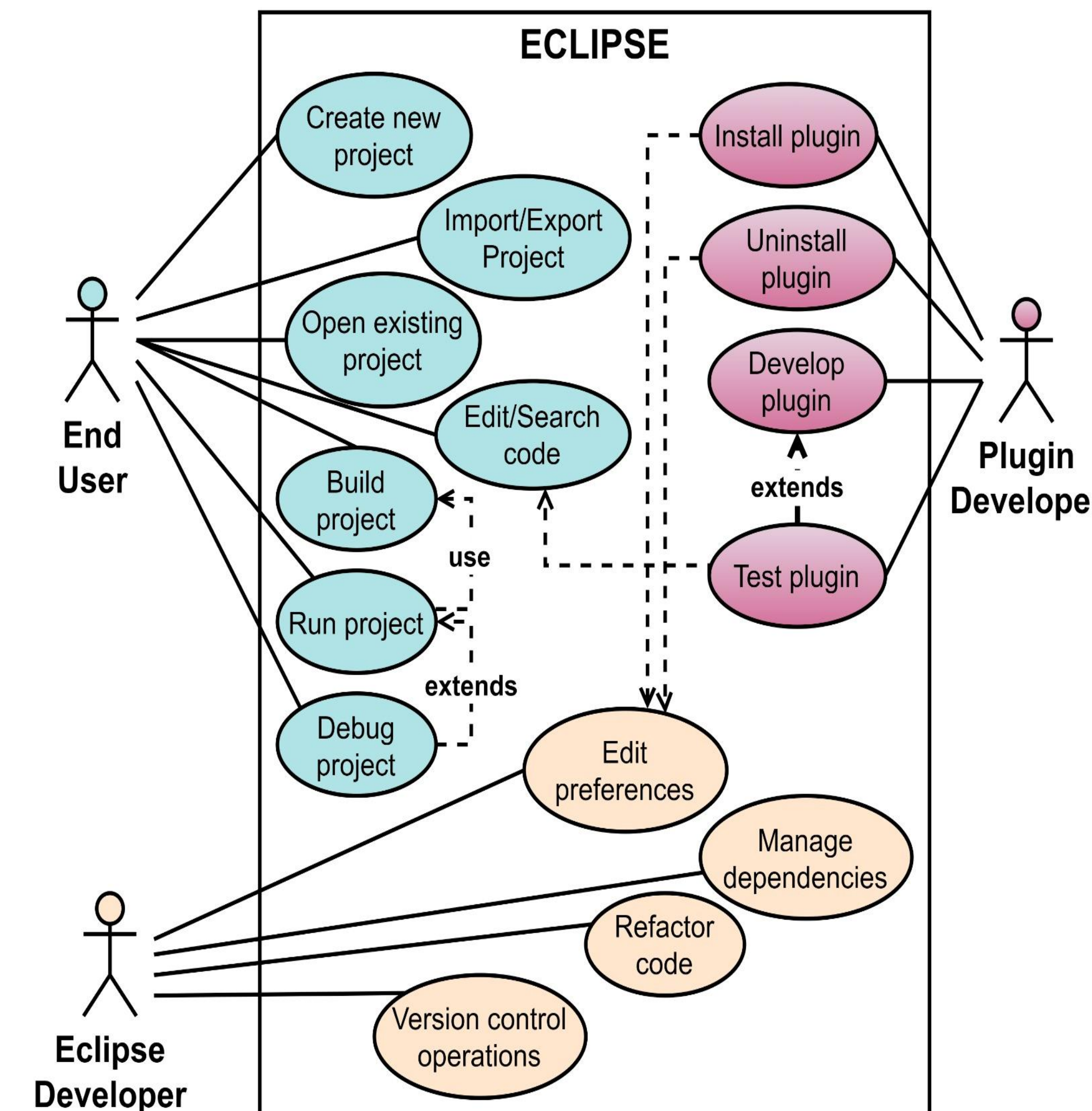- LEARNING & GROWTH

4. SOME ACTORS AND USE CASES

ECLIPSE

Create new project · Import/Export Project · Open existing project · Edit/Search code · Build project · Run project · Debug project · Install plugin · Uninstall plugin · Develop plugin · Test plugin · Edit preferences · Manage dependencies · Refactor code · Version control operations

End User · Plugin Developer · Eclipse Developer

use · extends · extends

Actor	Interactions	Examples
End User (Primary users such as Software Developers and QA Testers)	• **Project management:** Create, open, import/export projects • **Code handling:** Edit and search • **Development process:** Build, run, and debug projects	• **Software Development:** Code Editing, Debugging • **Training & Development:** Data Visualization, Scientific Libraries Integration
Plugin Developer	• **Plugin lifecycle:** Develop, test, install, and uninstall plugins	• Develop a new plugin project • Test the plugin via installation • Publish & distribute the plugin
Eclipse IDE Developer	• **Codebase management:** Develop and refactor code • **System settings:** Manage version control and edit preferences	• Developing Core Features • Maintaining the Codebase • Release new IDE version

5. IMPROVEMENTS

eclipse IMPROVEMENTS

Stakeholder & Purpose
- Identify crucial stakeholders
- Identify top needs of stakeholders

Documentation Management
- Define documentation responsibility
- Coordinate migration efforts

Presentation Quality
- Add overview diagram
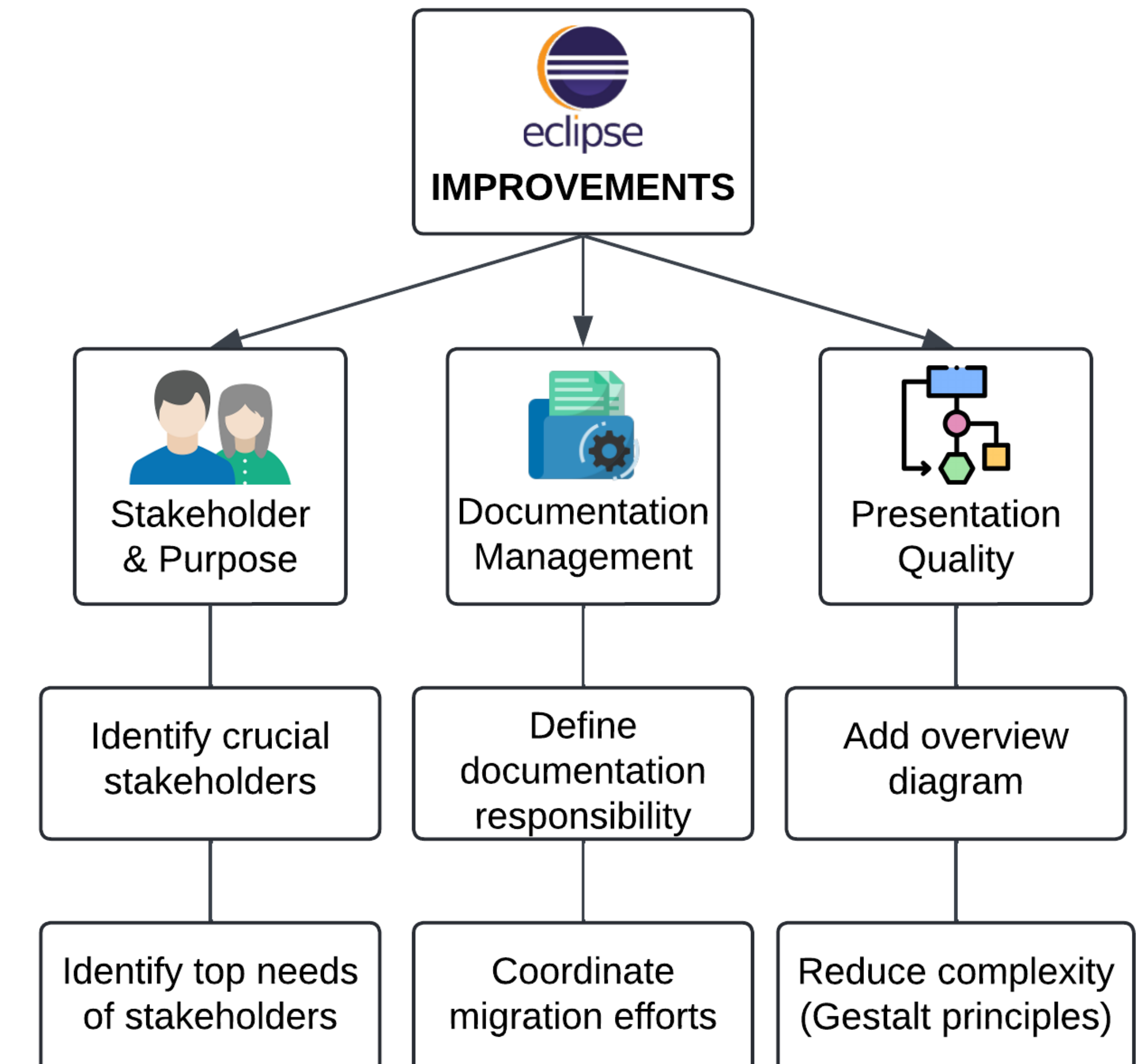- Reduce complexity (Gestalt principles)

6. LESSONS LEARNED

(1) Make sure to have concrete references for every piece of information in the presentation. **(2)** Ensure every presentation has a complete agenda, with an introduction and a conclusion. **(3)** Frequent communication and self-discipline are key to the project's success.

7. CONCLUSIONS

The Eclipse architecture embodies a robust, modular, and extensible framework that has revolutionized the development landscape. Its structure allows high flexibility, satisfying advanced use cases for different stakeholders. More architectural work is needed to enable maintenance and development in Eclipse with high satisfaction.

8. REFERENCES

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[4] D. Todorovic, "Gestalt principles," Scholarpedia, vol. 3, no. 12, p. 5345, 2008, doi: 10.4249/scholarpedia.5345.

[5] "IBM Host On-Demand 15.0.0." Accessed: Jun. 01, 2024. [Online]. Available: https://www.ibm.com/docs/en/host-on-demand/15.0?topic=support-creating-host-demand-plug-ins