**Architecture Overview**

The Improved Modular Media Player System refactors the old monolithic player into a flexible and maintainable architecture using Structural Design Patterns.

It is divided into several independent modules:

- Media Source (Adapter Pattern)

- Connects to different sources like local files, HLS streams, and remote APIs, ensuring uniform access through a common interface.

- Rendering Engine (Bridge Pattern)

- Separates playback logic from rendering, allowing switching between hardware and software modes at runtime.

- Feature Enhancements (Decorator Pattern)

- Lets users add optional features such as subtitles, equalizer, and watermark dynamically, stacking them on demand.

- Playlist Management (Composite Pattern)

- Supports nested playlists where each item can be a song or another playlist, enabling hierarchical organization.

- Remote Caching (Proxy Pattern)

- Adds a caching mechanism to optimize remote streaming performance, reducing redundant data fetches.

Each module is designed independently but works together through abstraction, making the system scalable, maintainable, and easier to extend than the legacy version.