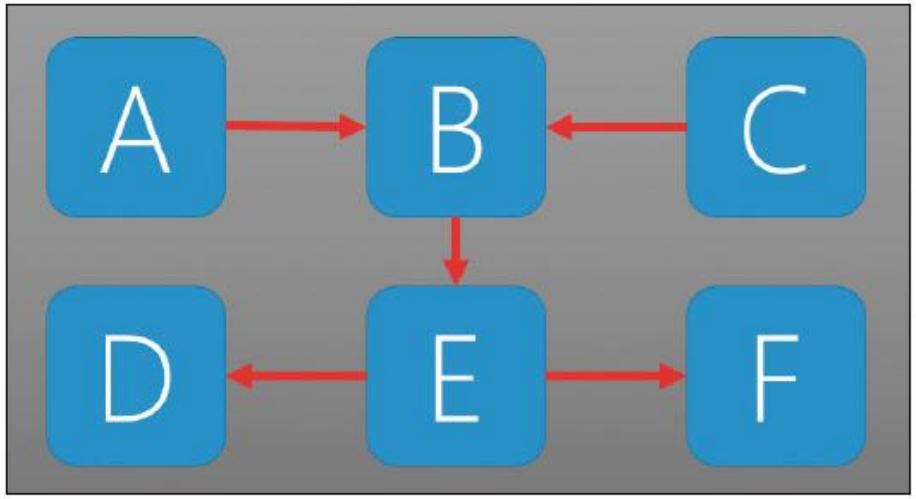
Application development

A standard architecture for practical use

Atilla Kati

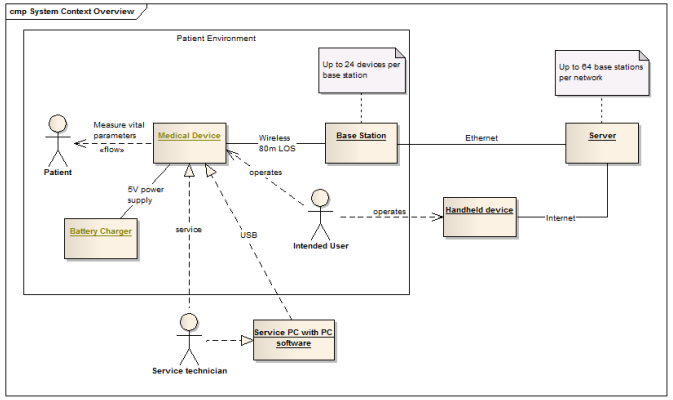
Problem definition & goals

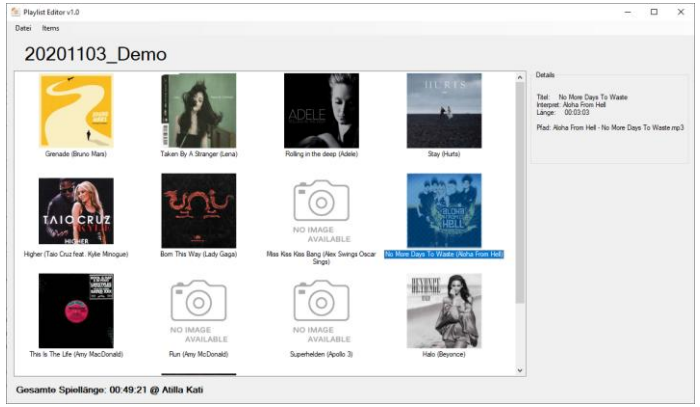
- What's wrong with the functional focus?



Problem definition & goals

- What's wrong with the functional focus?
- Fundamentals of software quality and architecture patterns
- Learning by doing





The software quality model

- ISO 25010/2011 (ISO/IEC 9126)

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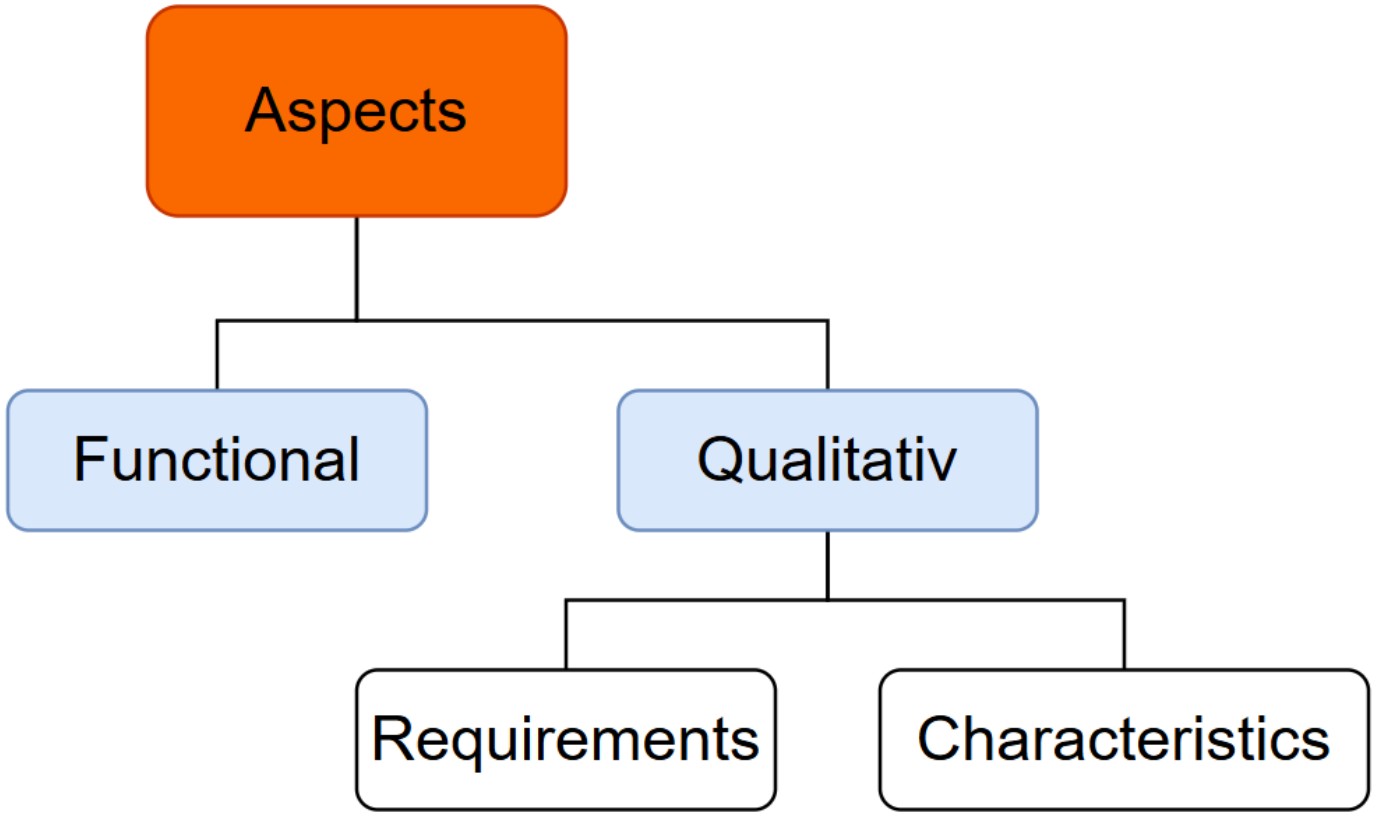
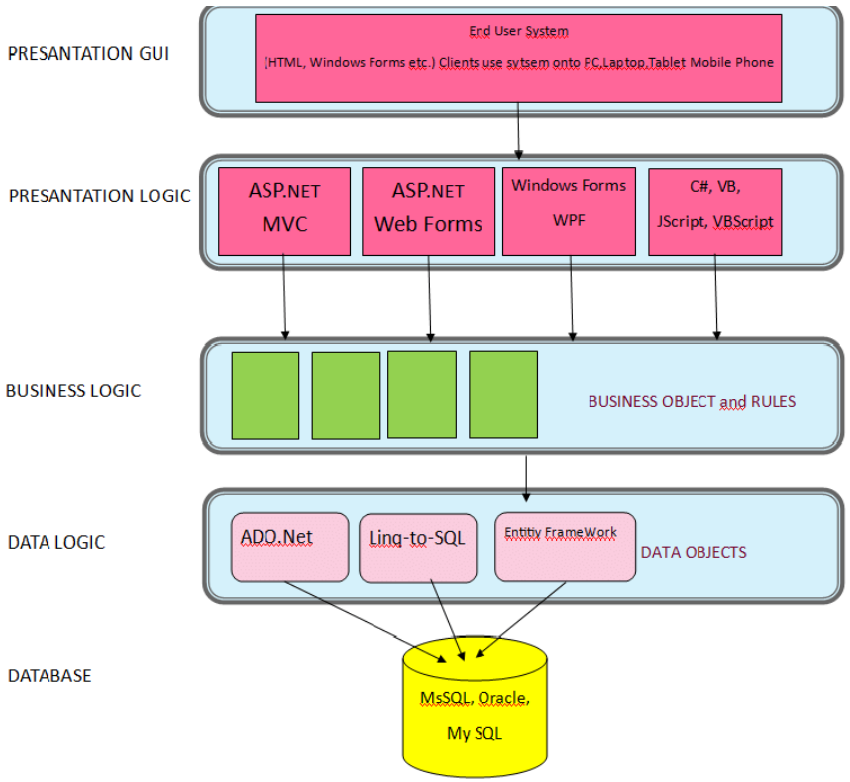


The software quality model

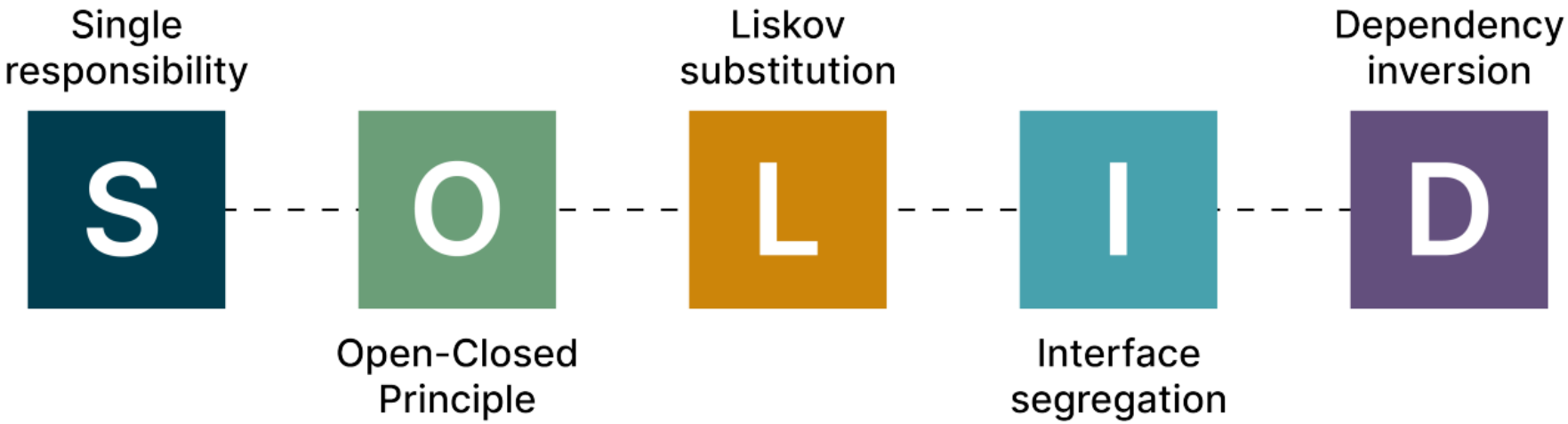
- Constant quality characteristics

Architectur – Design Patterns

Why to have a architectur?



Architectur – Design Principles



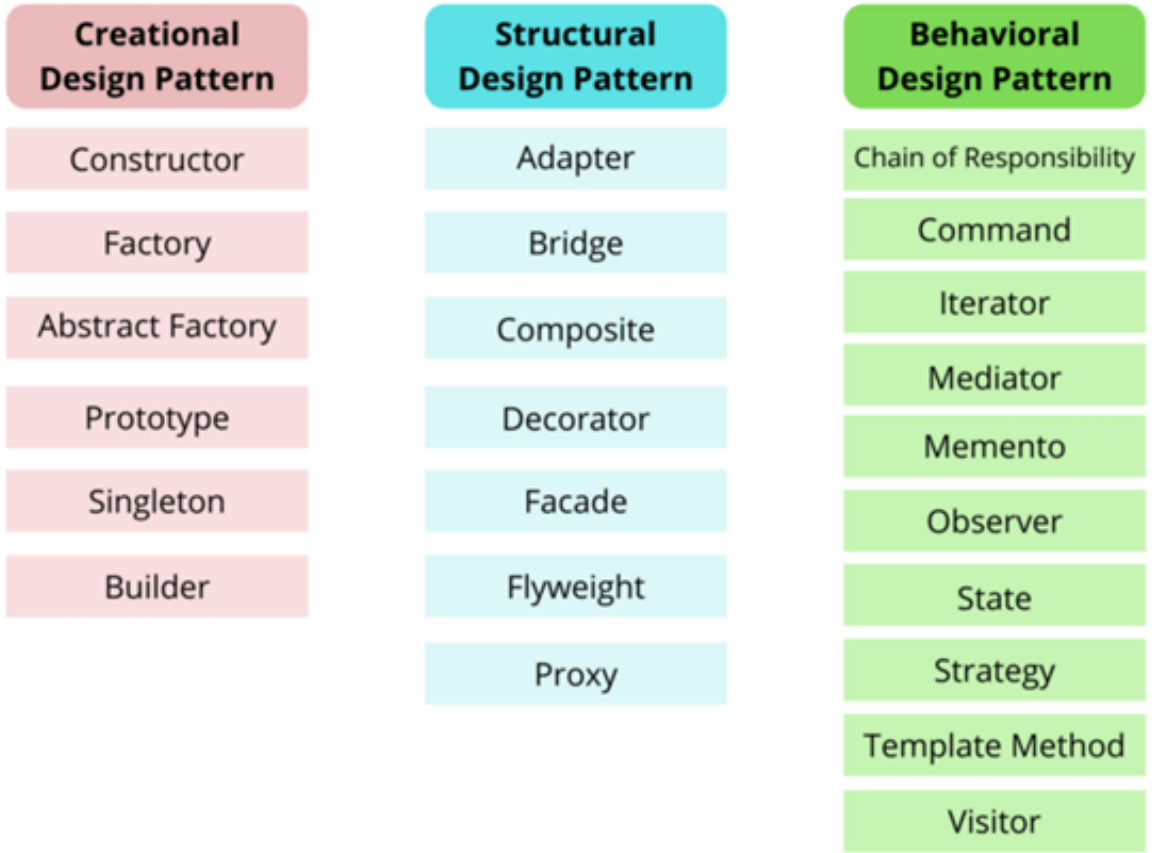
- **S**ingle Responsibility Principle
  Each class should have only one responsibility or reason to change.
- **O**pen/Closed Principle
  Software entities should be open for extension but closed for modification.
- **L**iskov Substitution Principle
  Subtypes must be substitutable for their base types without breaking the application.
- **I**nterface Segregation Principle
  Clients should not be forced to depend on interfaces they do not use.
- **D**ependency Inversion Principle
  Depend on abstractions, not on concrete implementations.

…acronym for five key object-oriented design principles, that help to create robust, maintainable software

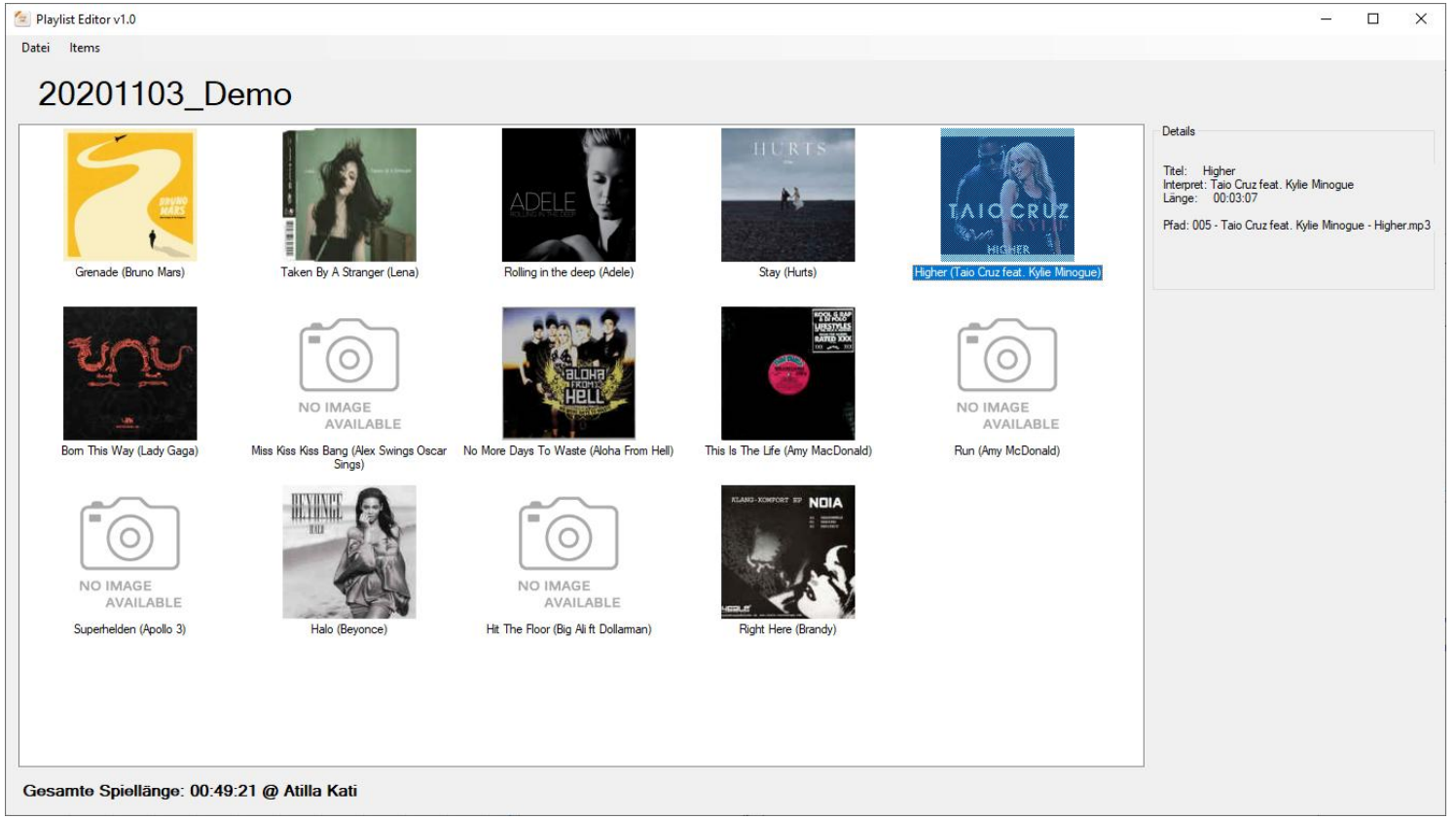
Architectur – Design Patterns

What are Design-Patterns?

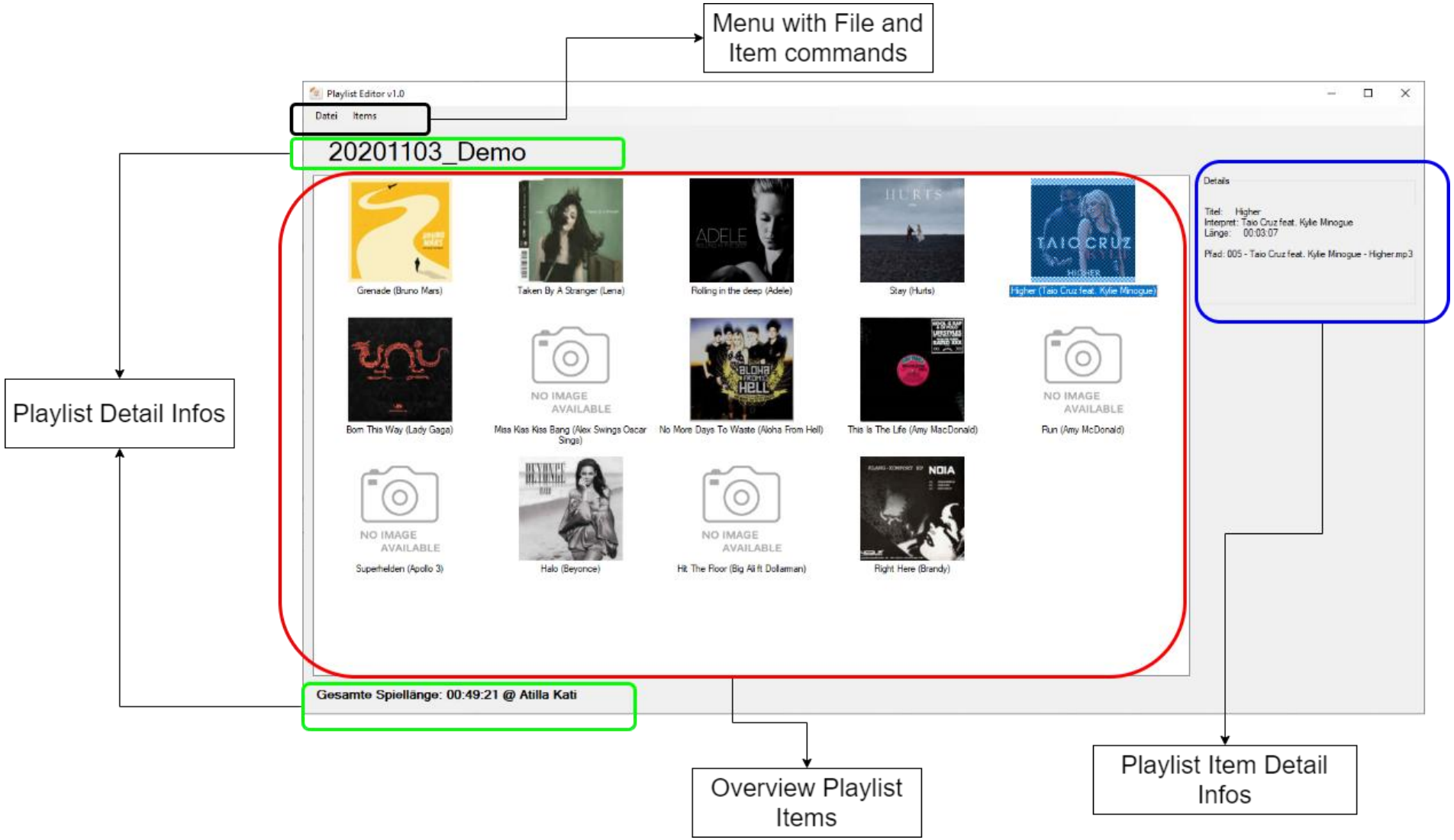
- Blueprints
- Based on design principles
- Solutions to specific problems
- Maintainability & reuse
- Common language



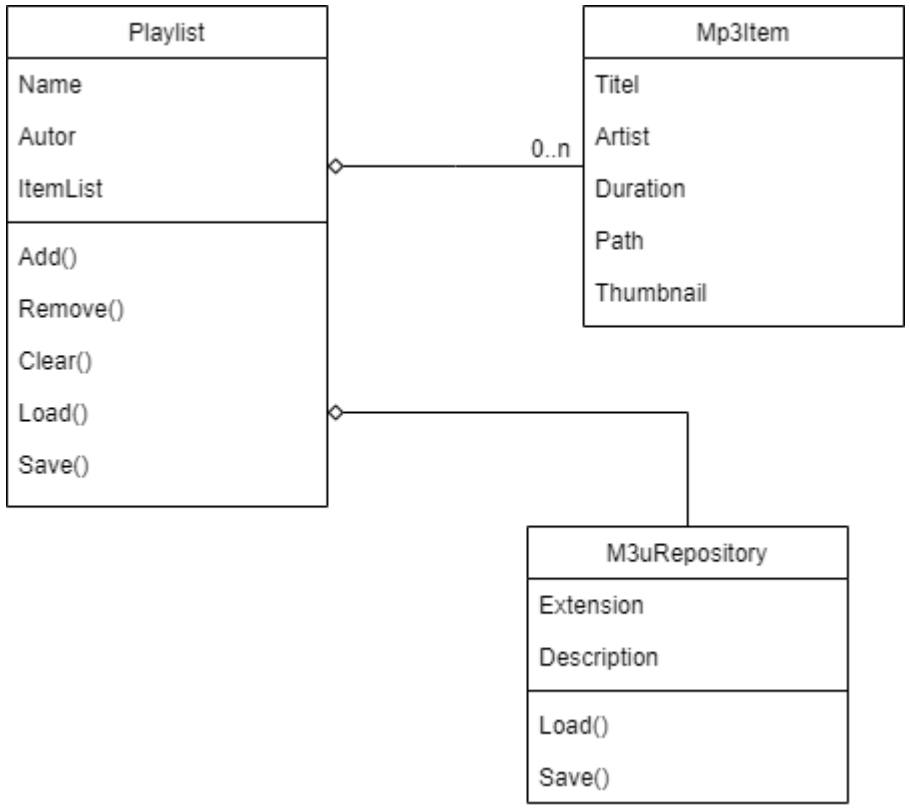
Our project


Playlist Editor v1.0
Datei
Items
20201103_Demo
Grenade (Bruno Mars)
Taken By A Stranger (Lena)
Rolling in the deep (Adele)
Stay (Hurts)
Higher (Taio Cruz feat. Kylie Minogue)
Born This Way (Lady Gaga)
Miss Kiss Kiss Bang (Alex Swings Oscar Sings)
No More Days To Waste (Aloha From Hell)
This Is The Life (Amy MacDonald)
Run (Amy McDonald)
Superhelden (Apollo 3)
Halo (Beyonce)
Hit The Floor (Big Ali ft Dollarman)
Right Here (Brandy)
NO IMAGE AVAILABLE
Details
Titel: Higher
Interpret: Taio Cruz feat. Kylie Minogue
Länge: 00:03:07
Pfad: 005 - Taio Cruz feat. Kylie Minogue - Higher.mp3
Gesamte Spiellänge: 00:49:21 @ Atilla Kati

Our project - Requirements

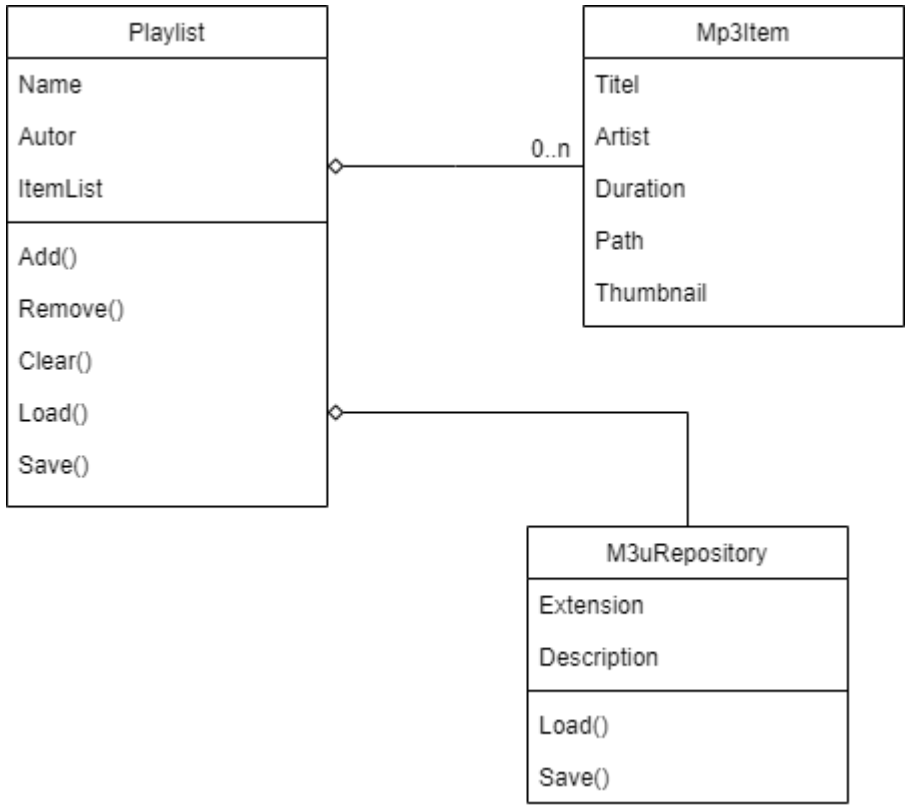


Our project - Requirements



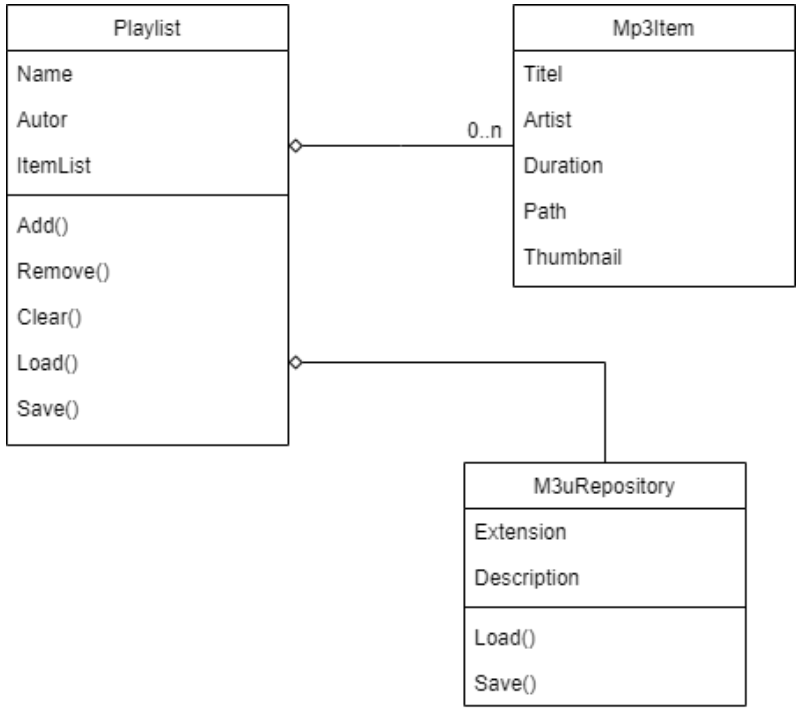
- It should also be possible to manage other media such as images or videos in a playlist. The type list should be easy to extend.
- It should be possible to load and save different playlist formats. The type list should be easy to extend.
- Thumbnails should always be displayed for playlist items
- For details on mp3 files, a media database should be contacted (imdb, discogs)

Our project - Requirements

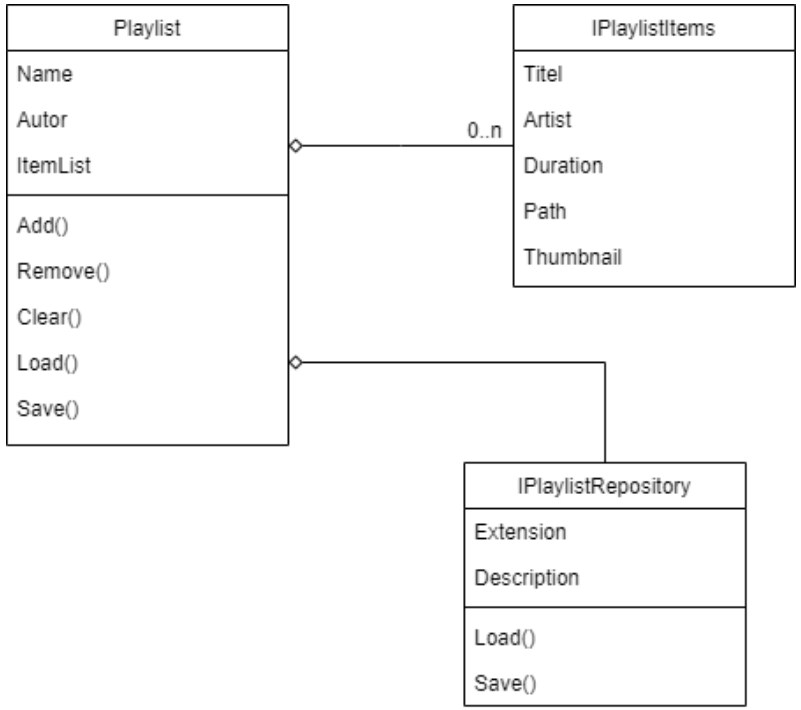


- For new item and playlist types, no existing (code) types should have to be changed
- Components should be able to be tested individually (as units)
- Dependencies (creation and usage dependencies) should be reduced or avoided

Our project - Solution



Our project - Solution



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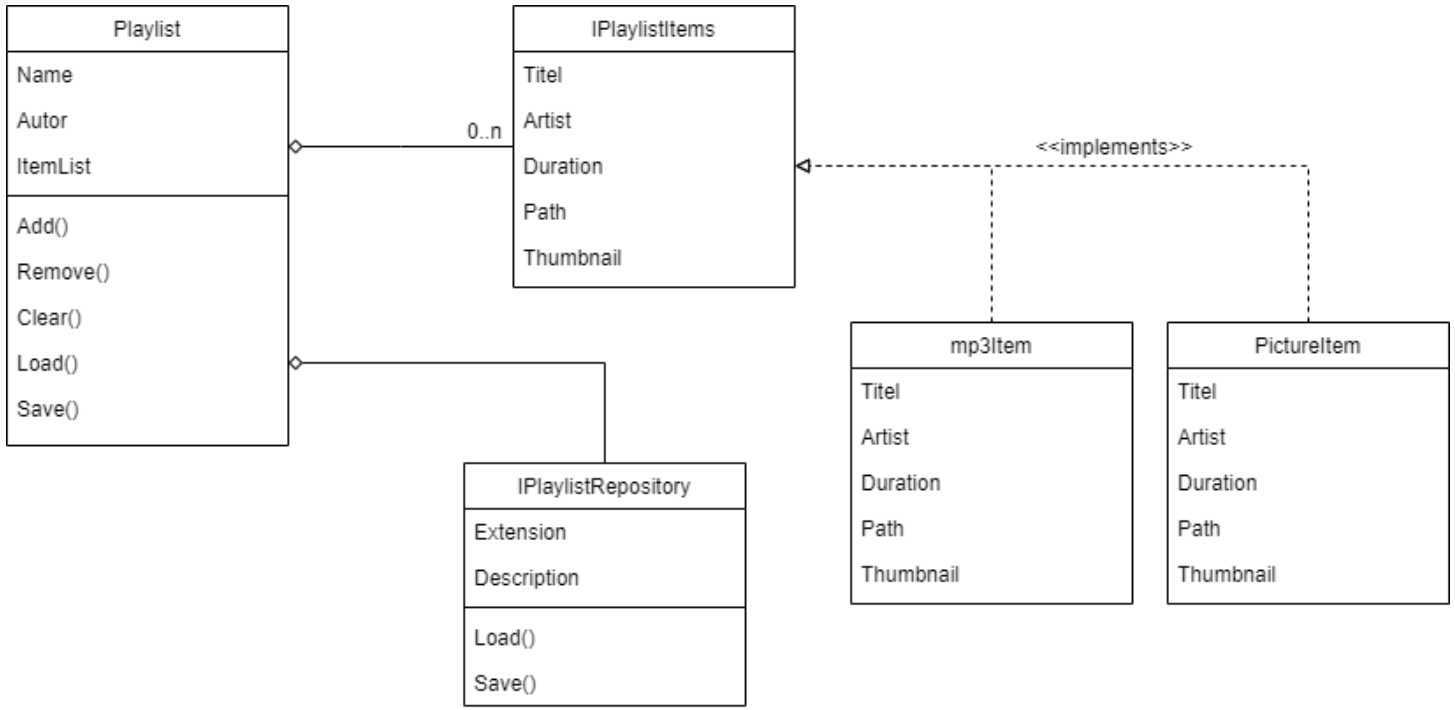

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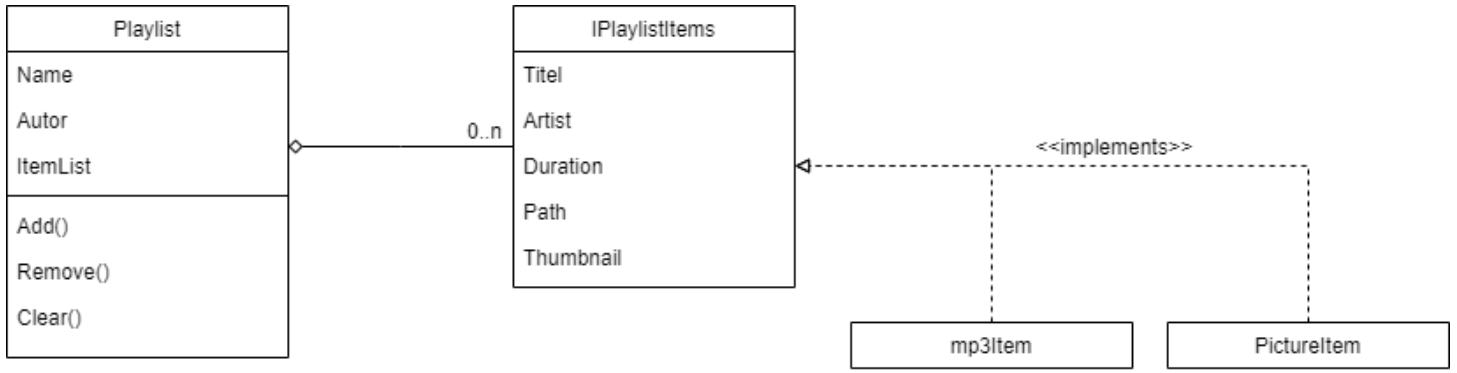

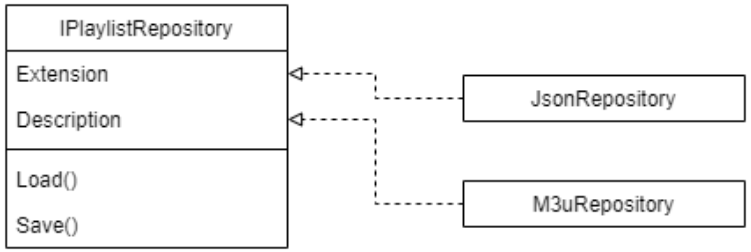

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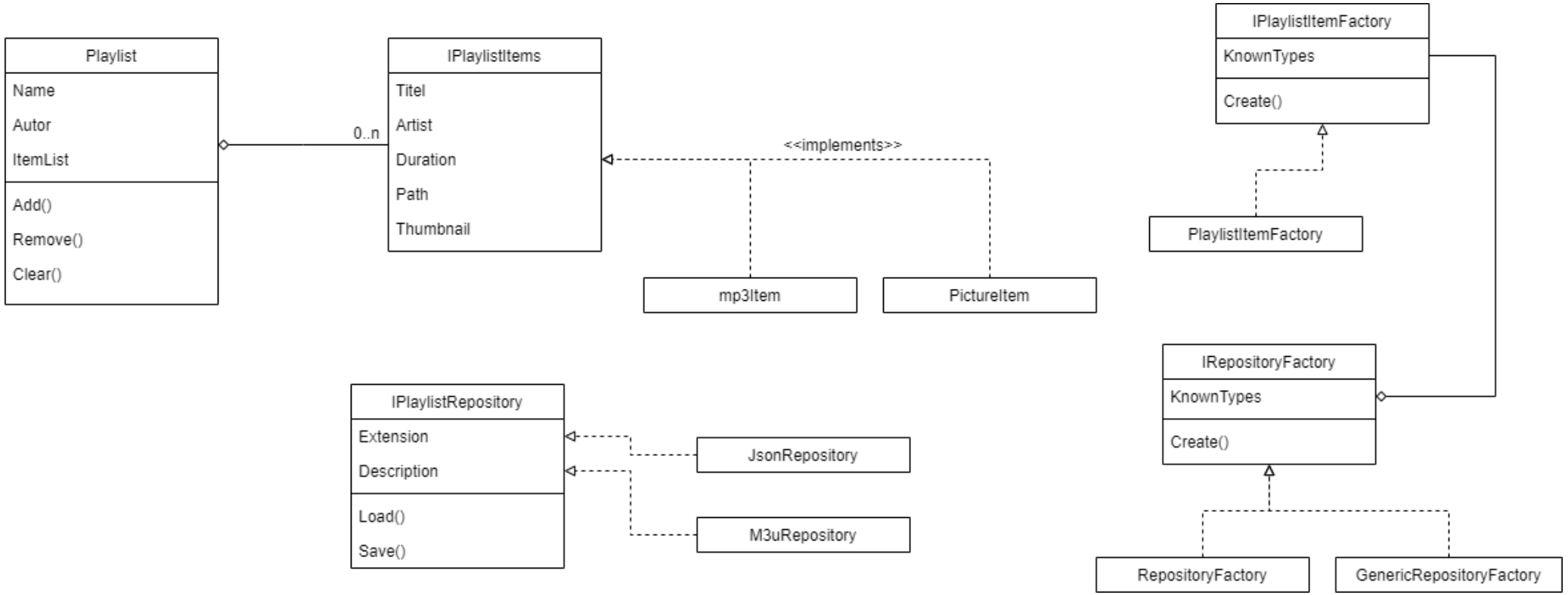

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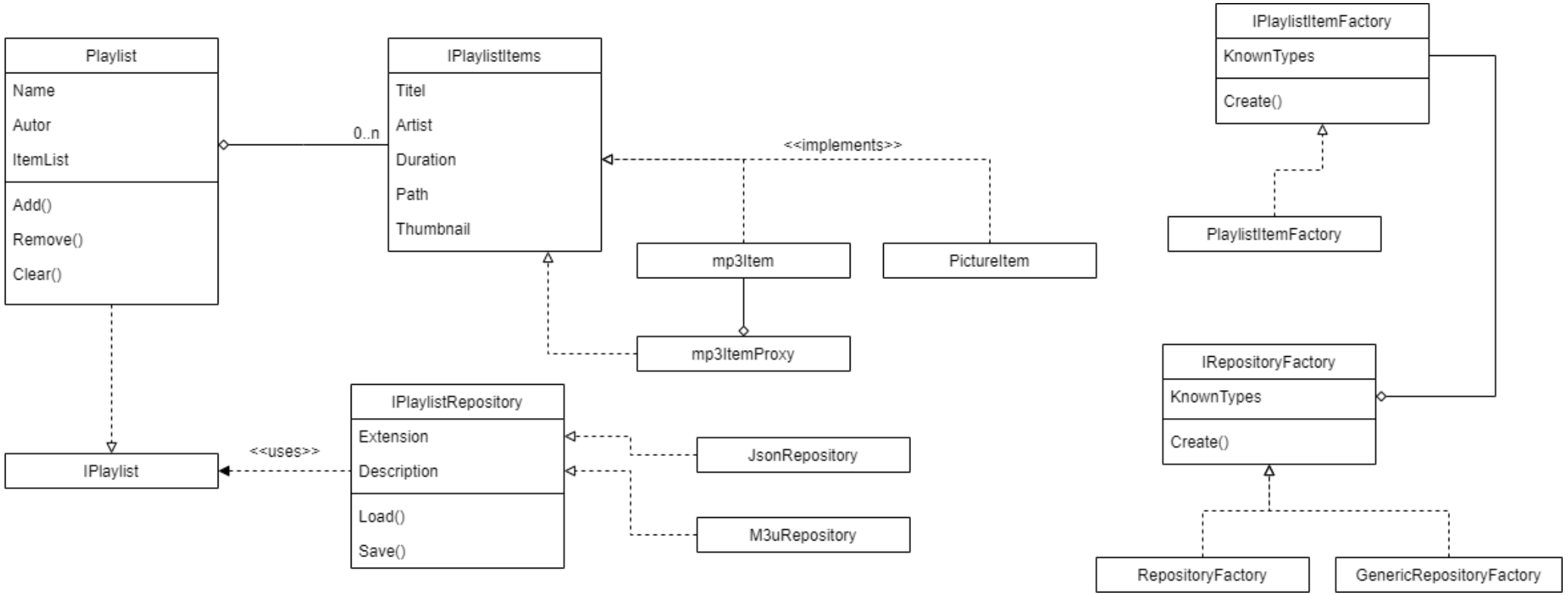
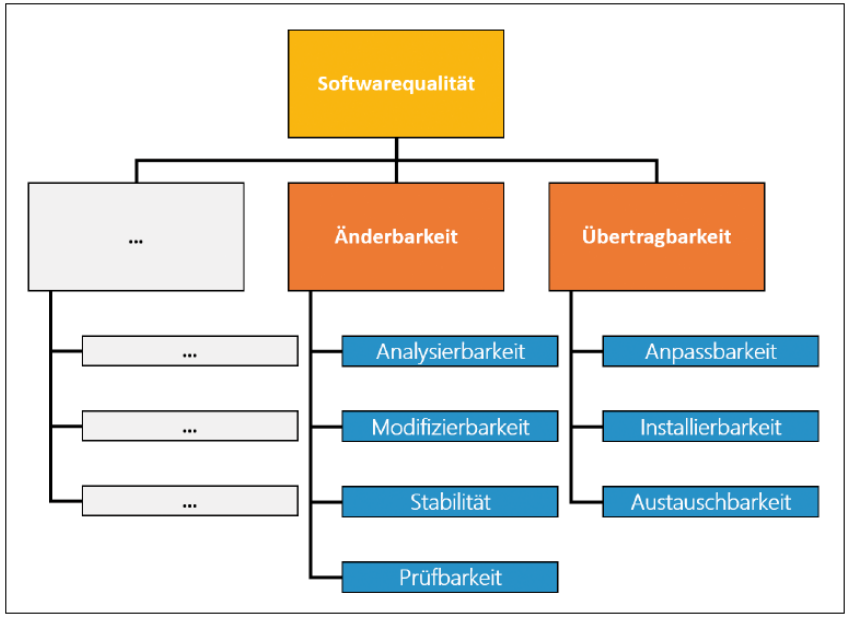


Conclusion



- Simplifying through
  - Single Responsibility Prinzip
  - Program to abstractions, not implementations
  - Composition over inheritance
  - Inversion of Control
- Resolve dependencies
  - Strategy Pattern
  - Dependency Injection
  - Factory Method

Danke!