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DI Why?

Getting a Grip on Dependency Injection

Jeremy Clark

Developer Betterer

jeremybytes.com

Level: Introductory / Intermediate

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Dependency Injection

The fine art of making things someone else's problem.

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Typical Introduction

```
private void BuildMainWindow()
{
    var builder = new ContainerBuilder();

    builder.RegisterType<SQLReader>().As<IPersonReader>()
        .SingleInstance();

    builder.RegisterSource(
        new AnyConcreteTypeNotAlreadyRegisteredSource());

    IContainer Container = builder.Build();

    Application.Current.MainWindow =
        Container.Resolve<PeopleViewerWindow>();
}
```

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What Is Dependency Injection?

- Dependency Injection is a software design pattern that allows a choice of component to be made at run-time rather than compile time.
  - Wikipedia 2012

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What Is Dependency Injection?

- Dependency injection is a software design pattern that allows the removal of hard-coded dependencies and makes it possible to change them, whether at run-time or compile-time.
  - Wikipedia 2013

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What Is Dependency Injection?

- Dependency injection is a software design pattern that implements inversion of control and allows a program design to follow the dependency inversion principle. The term was coined by Martin Fowler.
  - Wikipedia 2014

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What Is Dependency Injection?

- In software engineering, dependency injection is a software design pattern that implements inversion of control for software libraries, where the caller delegates to an external framework the control flow of discovering and importing a service or software module. Dependency injection allows a program design to follow the dependency inversion principle where modules are loosely coupled. With dependency injection, the client part of a program which uses a module or service doesn't need to know all its details, and typically the module can be replaced by another one of similar characteristics without altering the client.

  - Wikipedia 2015

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What Is Dependency Injection?

- In software engineering, dependency injection is a software design pattern that implements inversion of control for resolving dependencies. A dependency is an object that can be used (a service). An injection is the passing of a dependency to a dependent object (a client) that would use it. The service is made part of the client's state.[1] Passing the service to the client, rather than allowing a client to build or find the service, is the fundamental requirement of the pattern.
  - Wikipedia 2016

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What Is Dependency Injection?

- Dependency Injection is a set of software design principles and patterns that enable us to develop loosely coupled code.
  - Mark Seemann

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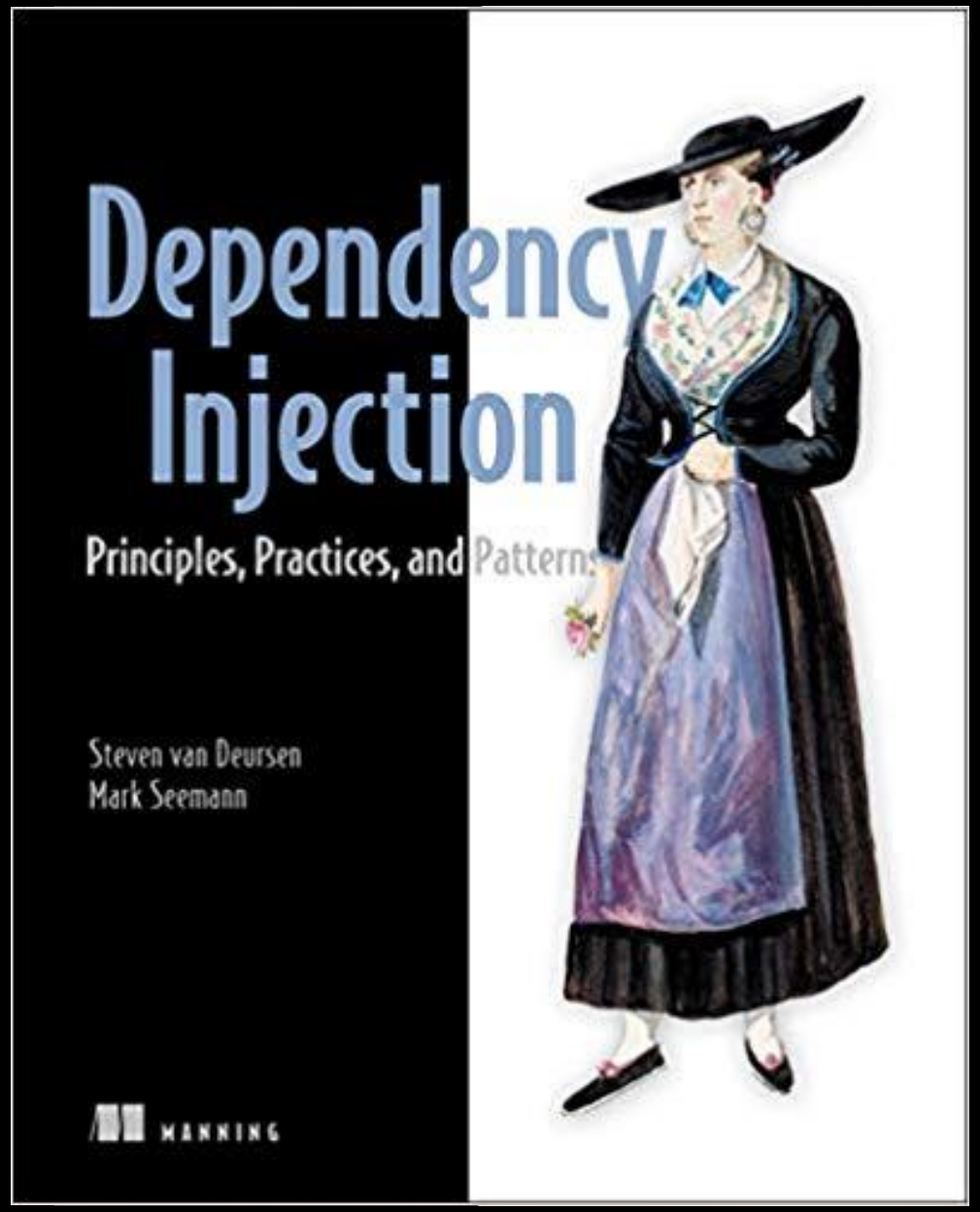
Dependency Injection

Principles, Practices, and Patterns

- Mark Seemann
- Steven van Deursen



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Primary Benefits

- Extensibility
- Parallel Development
- Maintainability
- Testability
- Late Binding

- Adherence to S.O.L.I.D. Design Principles.

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Benefits – Extensibility

Code can be extended in ways not explicitly planned for.

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Benefits – Parallel Development

Code can be developed in parallel with less chance of merge conflicts.

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Benefits – Maintainability

Classes with clearly defined responsibilities are easier to maintain.

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Benefits – Testability

Classes can be unit tested,
i.e., easily isolated from other classes
and components for testing.

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Benefits – Late Binding

Services can be swapped with other services without recompiling code.

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Benefits – SOLID Principles

- Single Responsibility Principle (SRP)
- Open/Closed Principle (OCP)
- Liskov Substitution Principle (LSP)
- Interface Segregation Principle (ISP)
- Dependency Inversion Principle (DIP)

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Dependency Injection Concepts

- DI Design Patterns
  - Constructor Injection
  - Property Injection
  - Method Injection
  - Ambient Context
  - Service Locator
- Dimensions of DI
  - Object Composition
  - Interception
  - Lifetime Management

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Dependency Injection Containers

- C# Containers
  - Autofac
  - Ninject
- Frameworks w/ Containers
  - ASP.NET Core
  - Angular
  - Prism

and many others

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Application Layers

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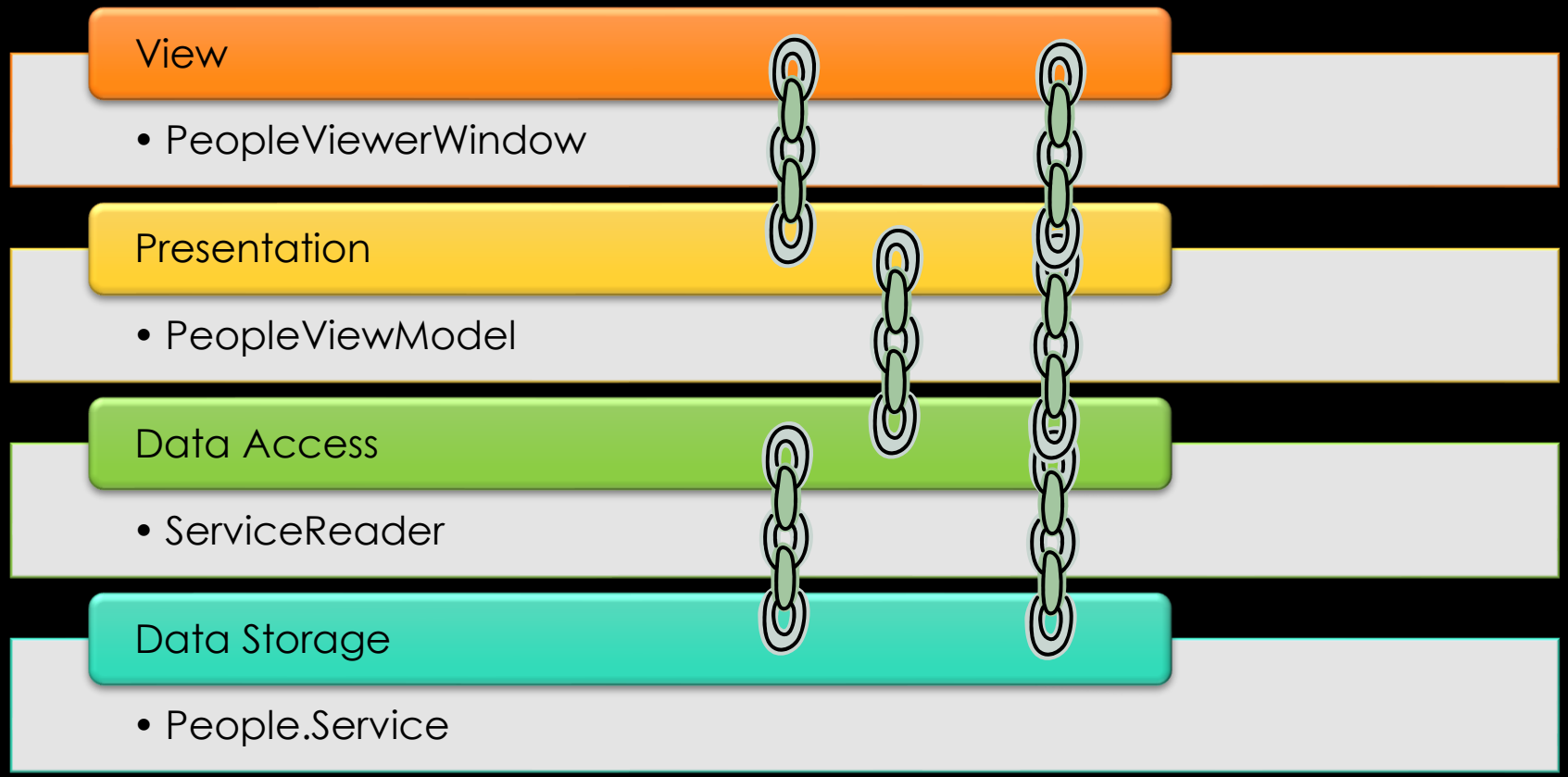
Tight Coupling



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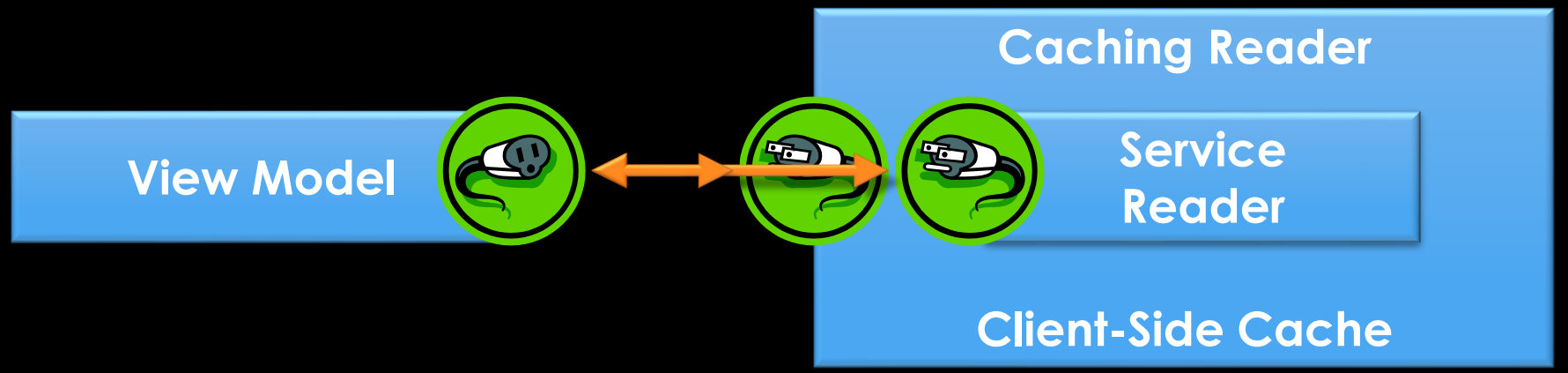
Creating a Caching Reader

The Decorator Pattern



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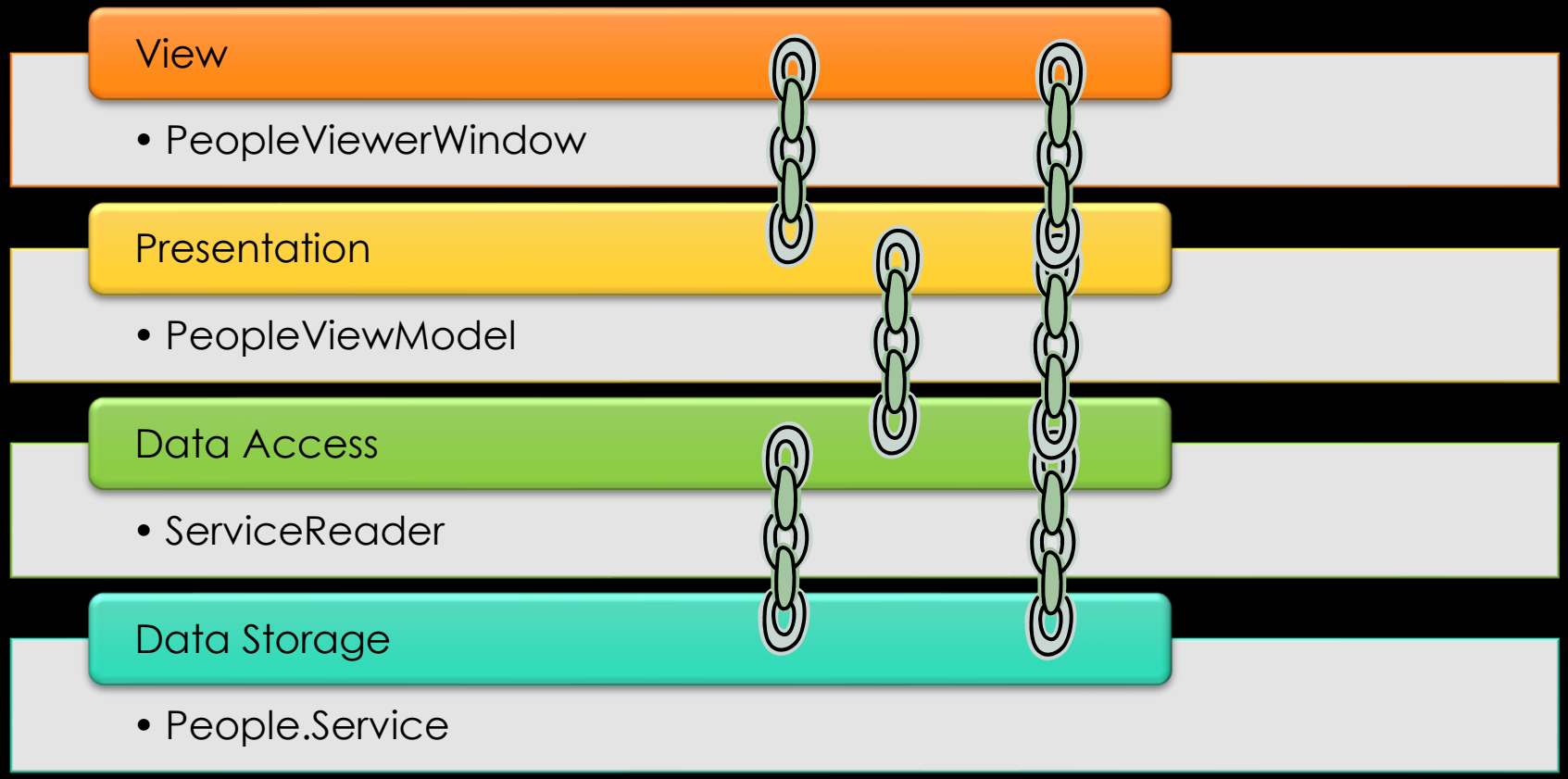
Loose(r) Coupling



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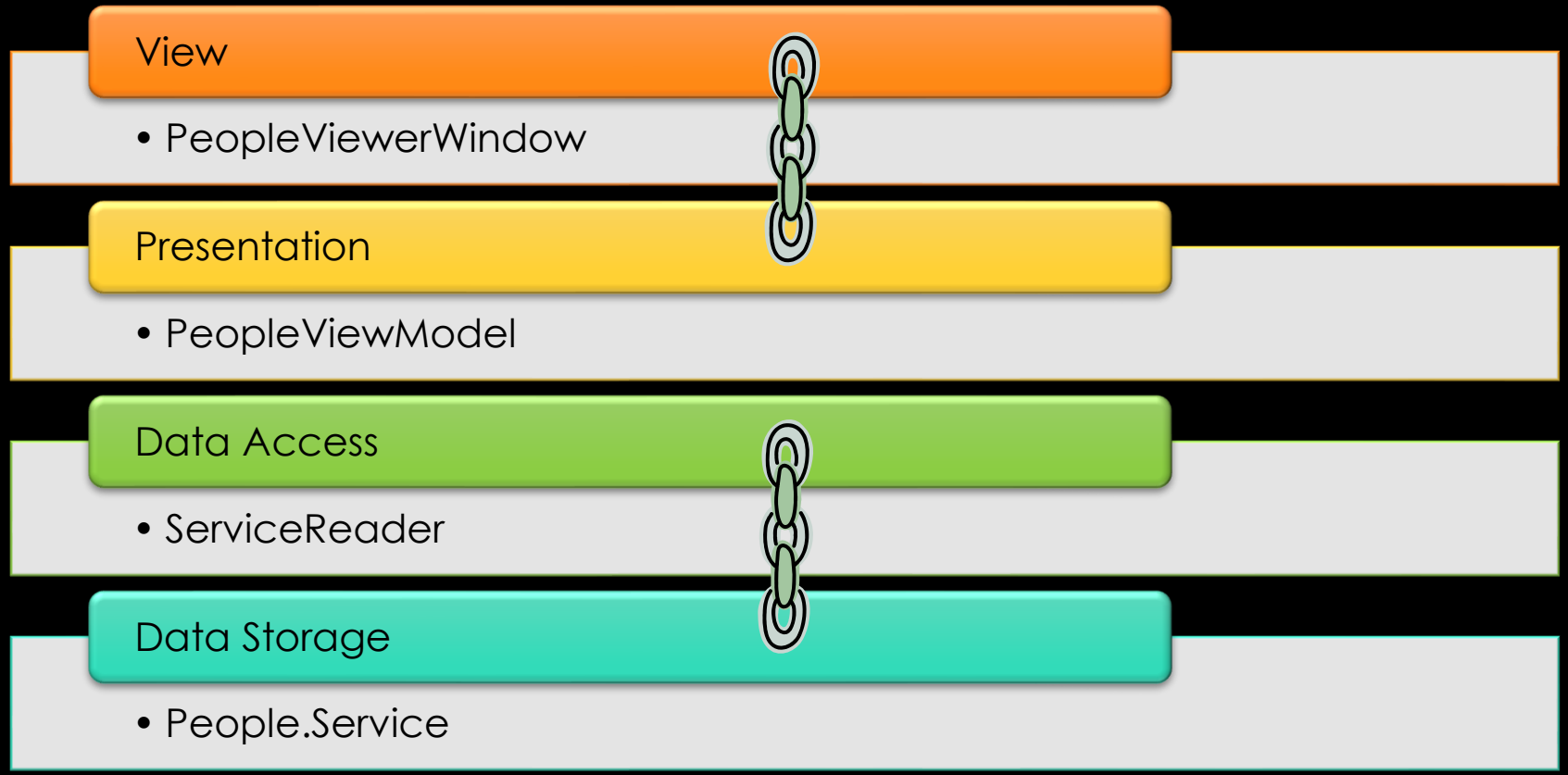

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Thank You!

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- youtube.com/jeremybytes

- github.com/jeremybytes/sdd-2024

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