Enterprise Software Development

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definitely does compute

Clean Architecture

with ASP.NET Core 2.1

DDD Melbourne - 2018

Jason Taylor

SSW Solution Architect

Started programming with BASIC on C64,

Keeping it simple since 1994!

jasongtau

codingflow.net

github.com/jasongt

youtube.com/jasongt

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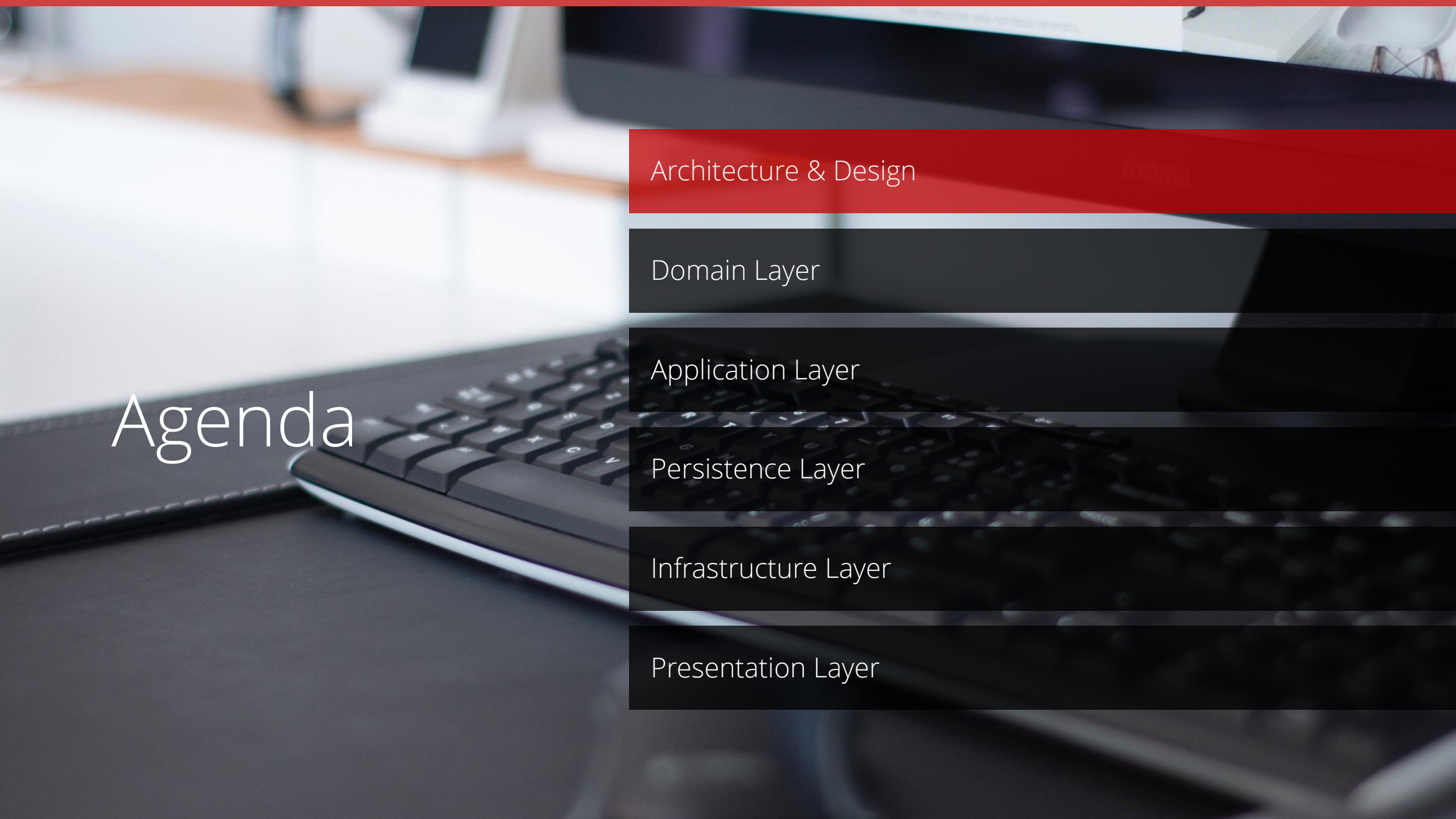


Agenda

- Architecture & Design
- Domain Layer
- Application Layer
- Persistence Layer
- Infrastructure Layer
- Presentation Layer

Overview

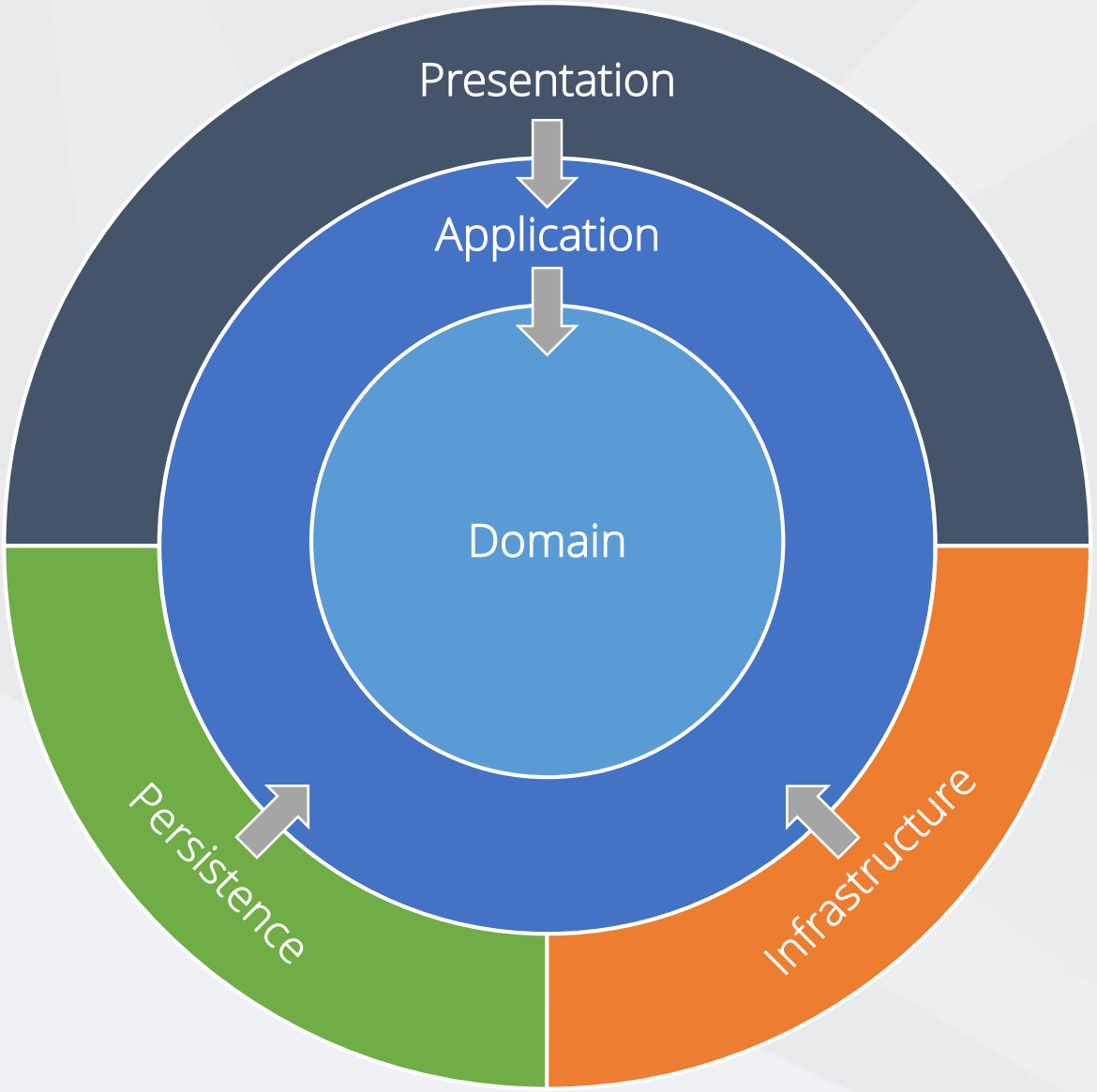
Independent of frameworks

Testable

Independent of UI

Independent of database

Independent anything external



Northwind Traders

Cross Platform

.NET Core

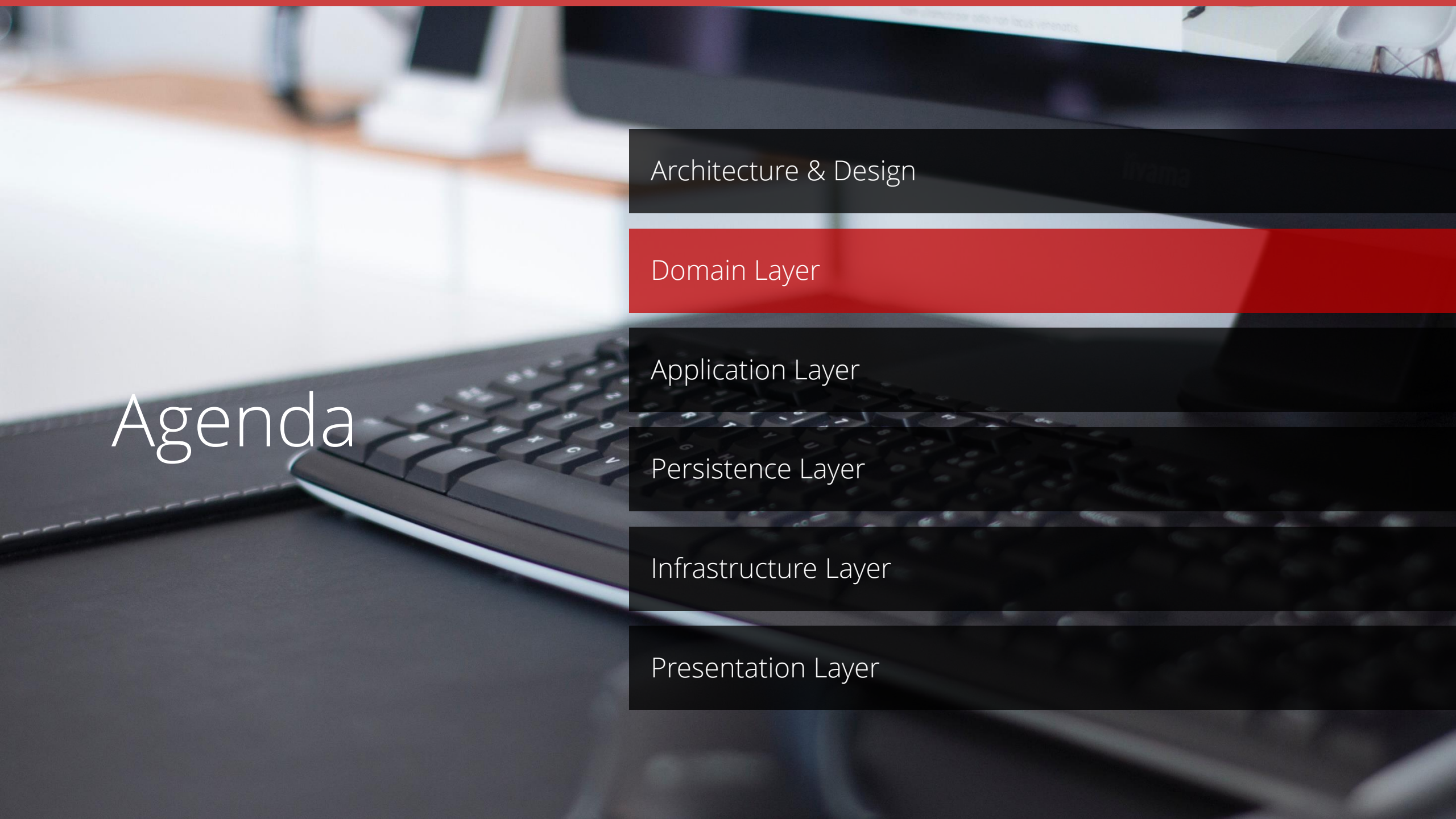
Entity Framework Core

Code First

Data Seeding

Key Points

- Domain contains enterprise-wide types and logic
- Application contains application-specific types and logic
- Infrastructure (including Persistence) contain all external concerns
- Presentation and Infrastructure depend only on Application
- Infrastructure and Presentation components can be replaced with minimal effort



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Overview

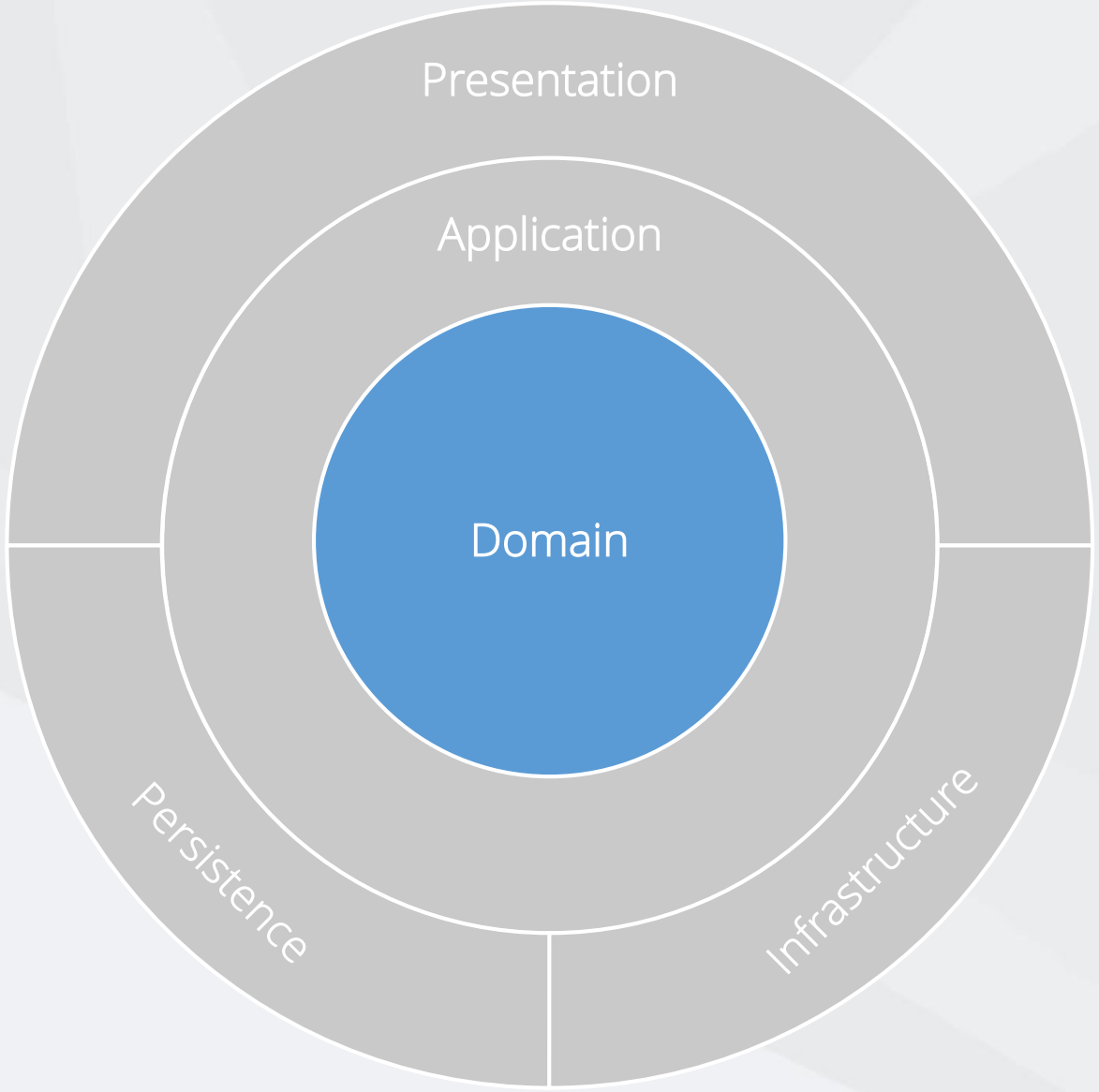
Entities

Value Objects

Enumerations

Logic

Exceptions

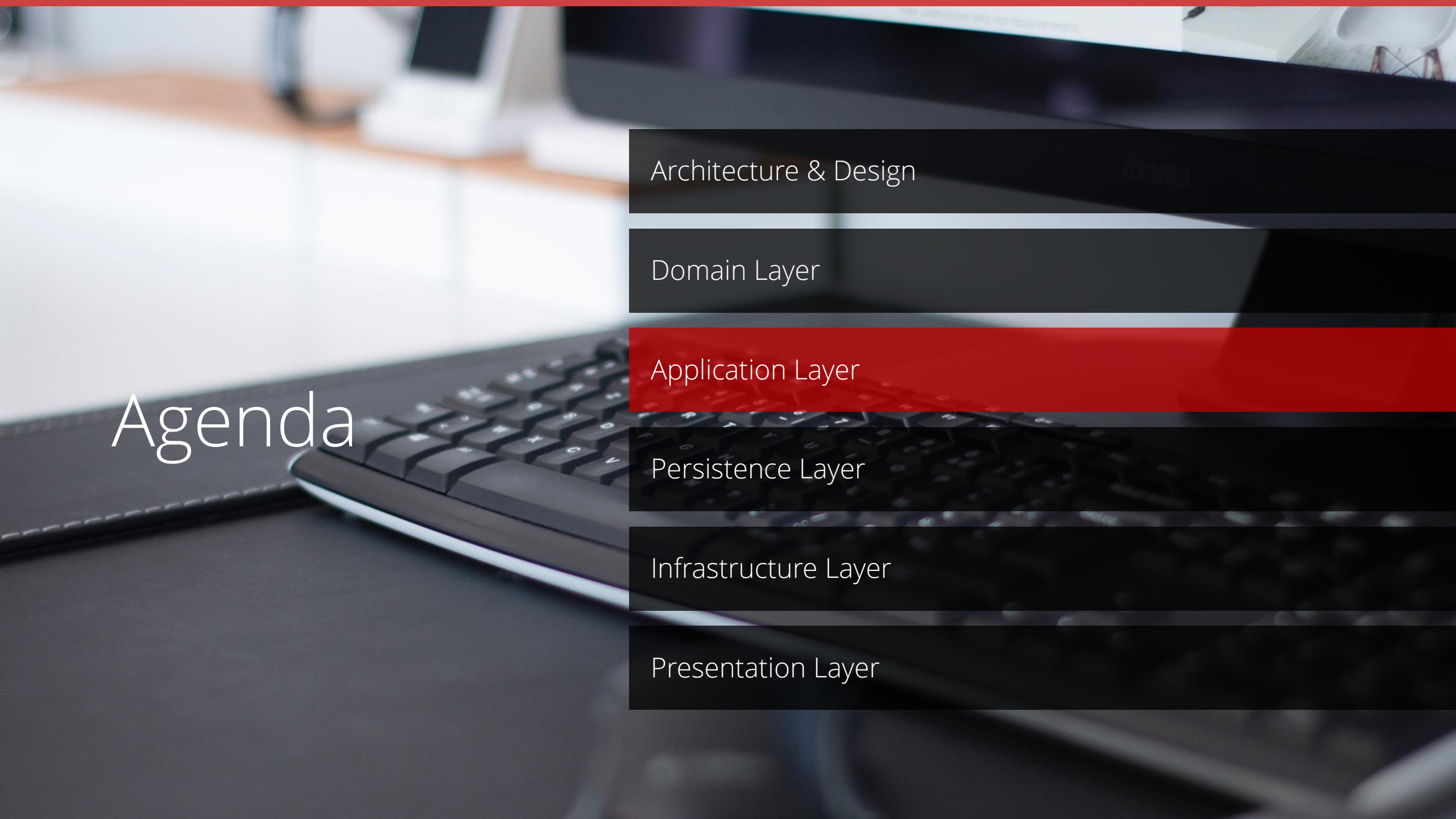


Demo

Reviewing the Domain layer

Key Points

- Use data annotations sparingly
- Use value objects when appropriate
- Initialise all collections & use private setters
- Create custom domain exceptions



Agenda

- Architecture & Design
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- **Application Layer**
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Overview

Interfaces

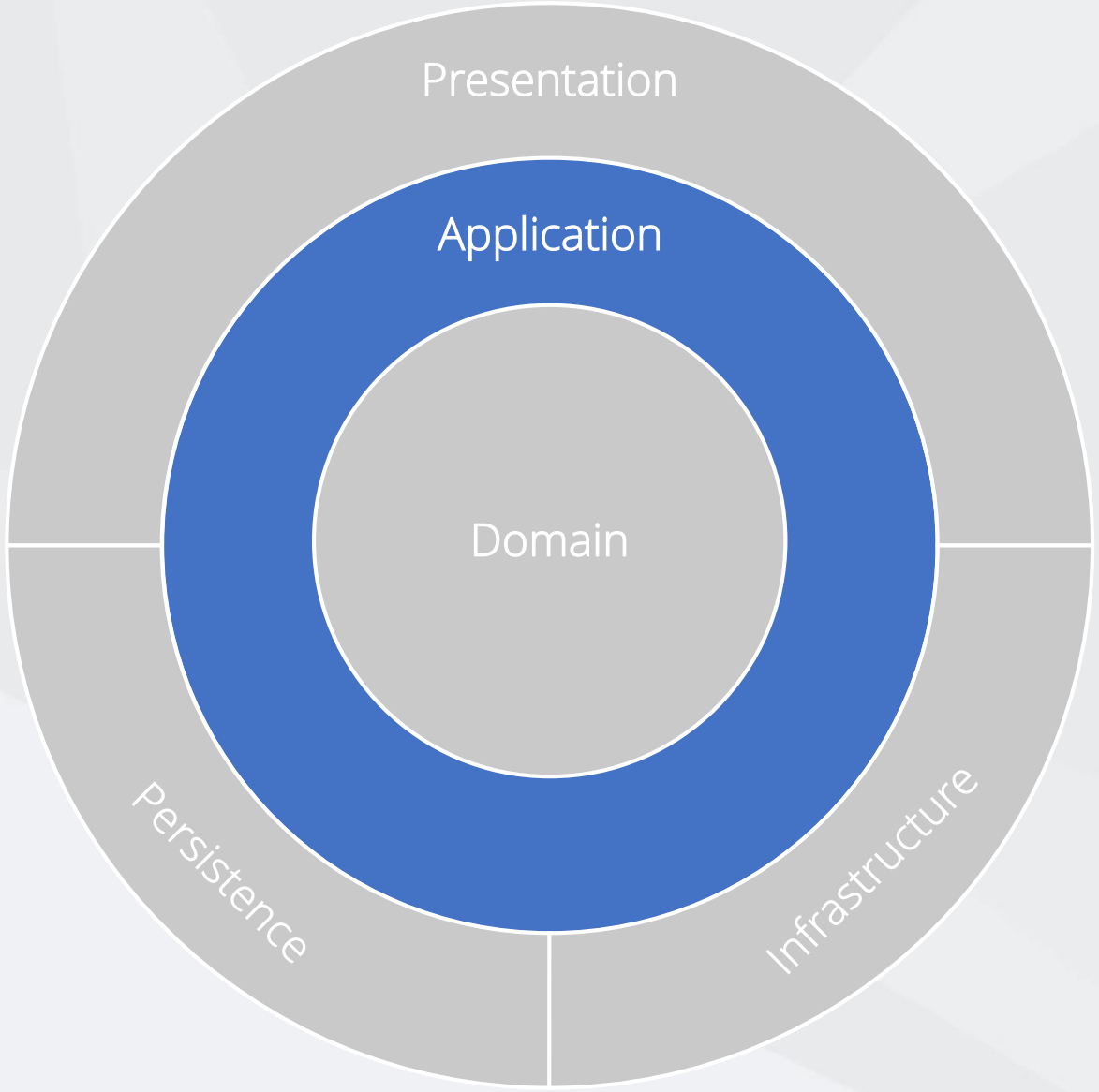
Models

Logic

Commands / Queries

Validators

Exceptions



CQRS

Command Query Responsibility Segregation

Separate reads (queries) from writes (commands)

Can maximise performance, scalability, and security

Can simplify your over all design

Easy to add new features, just add a new query or commands

Easy to maintain, changes only affect one command or query

MediatR + CQRS = ❤

Define queries and commands as requests

Application layer is just a series of request / response objects

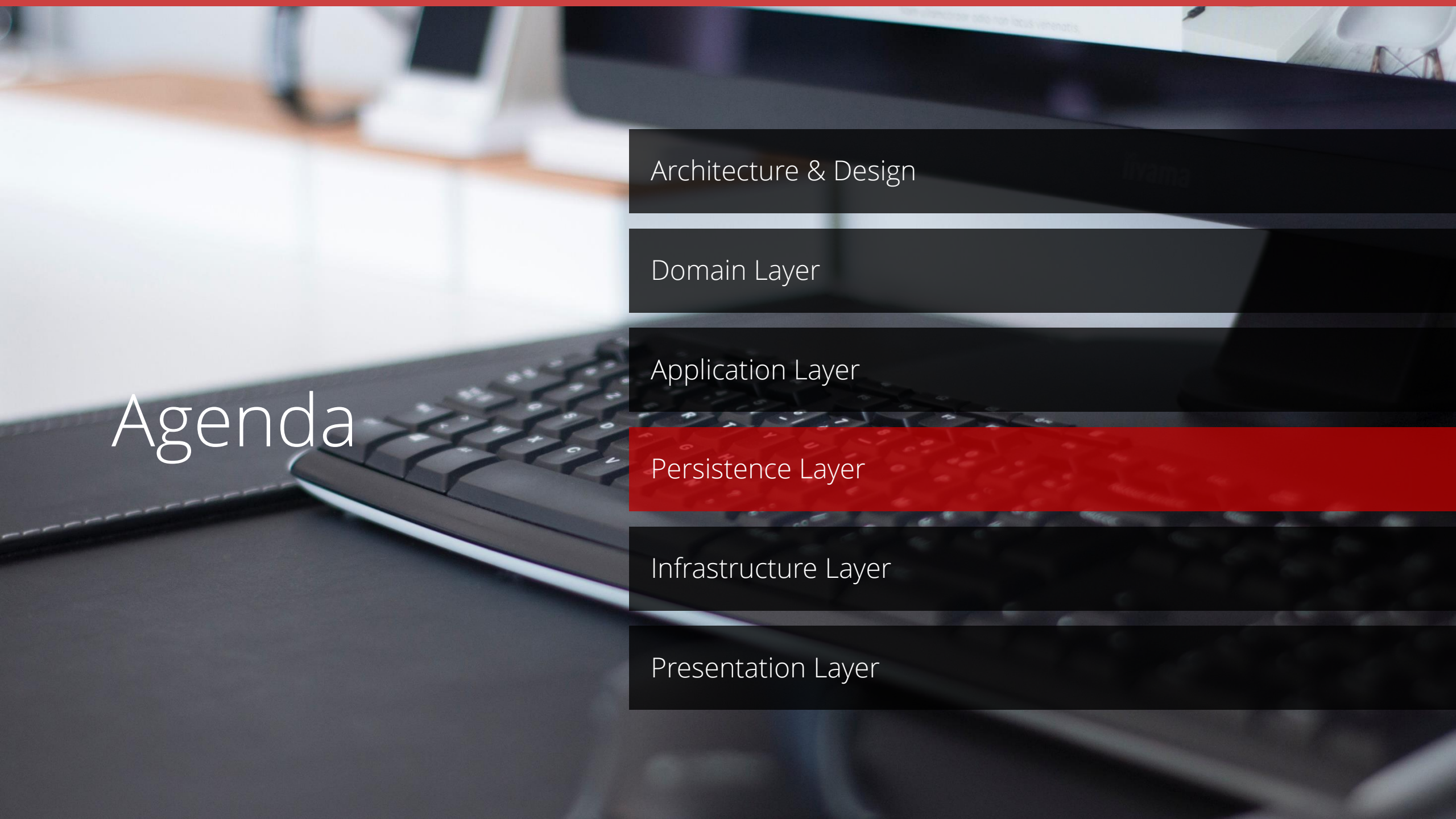
Ability to attach additional behaviour before and / or after each request, e.g. logging, validation, caching, authorisation and so on

Demo

Reviewing the Application layer

Key Points

- Using CQRS + MediatR simplifies your overall design
- Fluent Validation is useful for simple and complex validation scenarios
- MediatR simplifies cross cutting concerns such as logging and validation
- Independent of infrastructure and data access concerns



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- Architecture & Design
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Overview

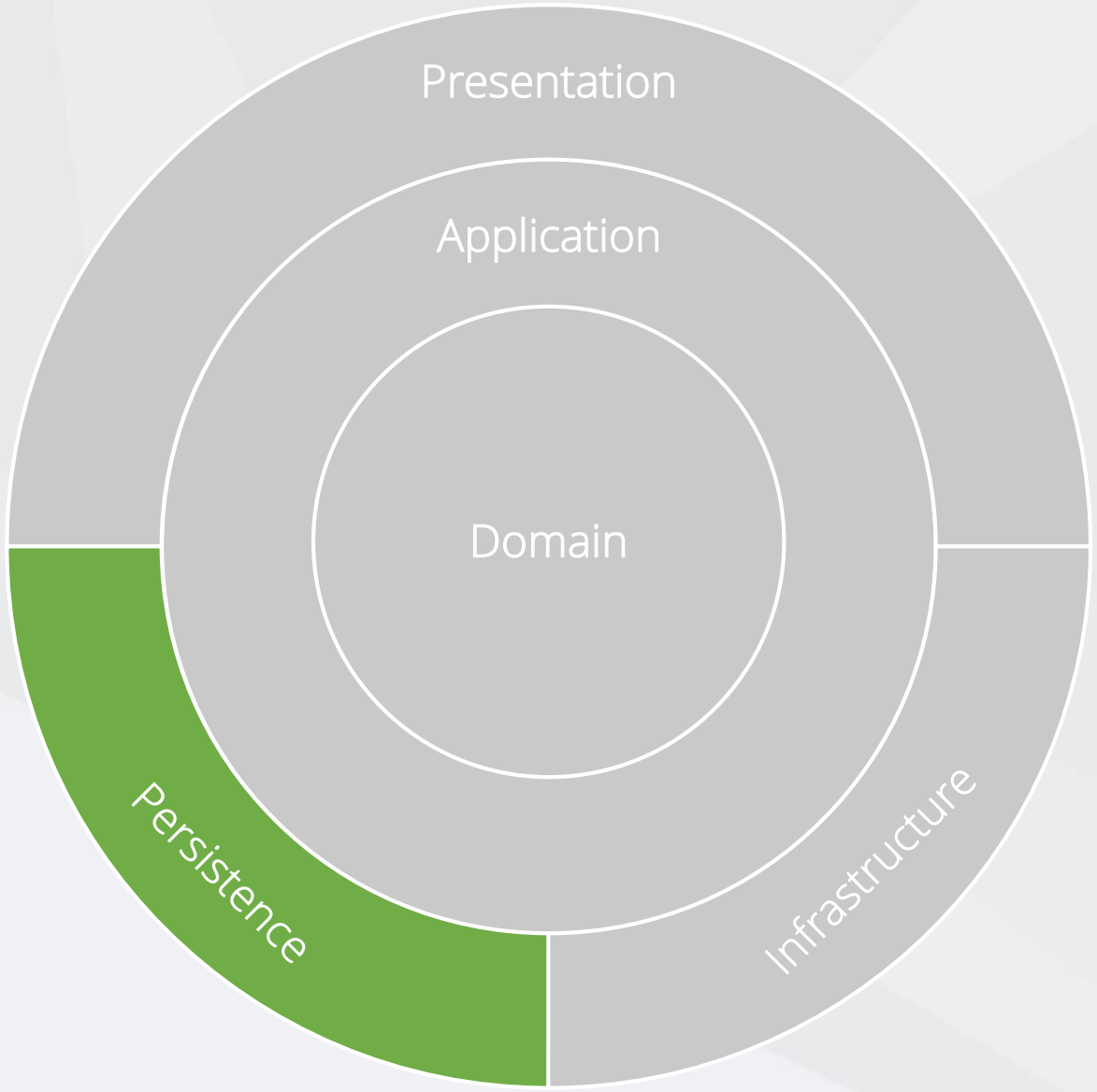
DbContext

Migrations

Configurations

Seeding

Abstractions



Unit of Work and Repository Patterns

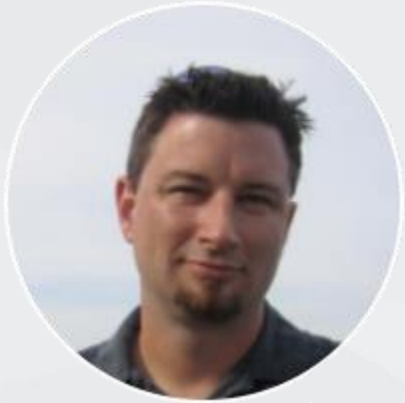
Should we implement these patterns?

It isn't always the best choice, because:

- EF Core insulates your code from database changes
- DbContext acts as a unit of work
- DbSet acts as a repository
- EF Core has features for unit testing without repositories

What do the experts think?

I'm over Repositories, and definitely over abstracting your data layer.



No, you don't *need* a repository. But there are many benefits and you should consider it!

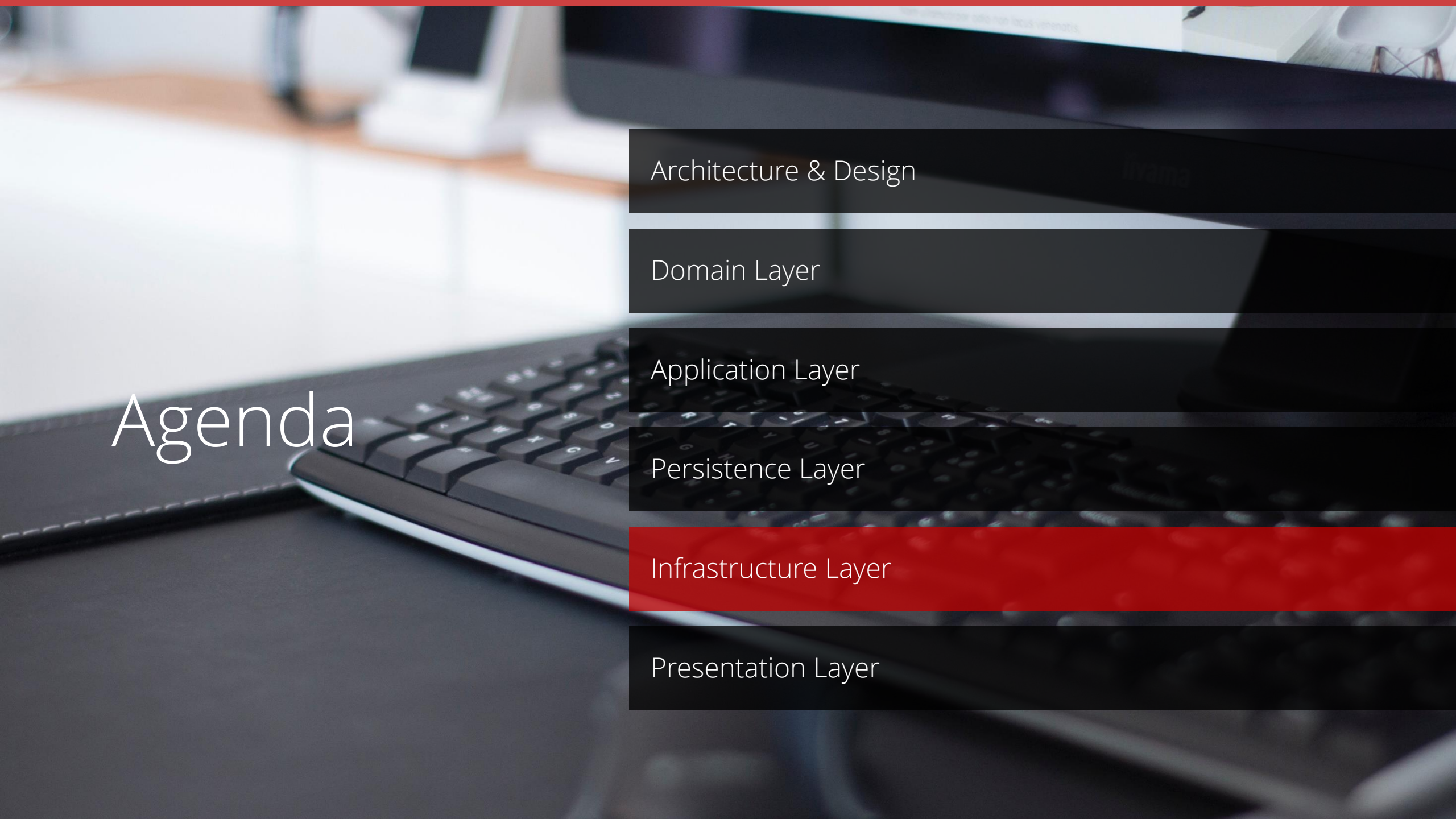
No, the repository/unit-of-work pattern isn't useful with EF Core.

Demo

Reviewing the Persistence layer

Key Points

- Independent of the database
- Prefer conventions over configuration
- Use Fluent API Configuration over Data Annotations
- Automatically apply all entity type configurations



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Overview

Implementations, e.g.

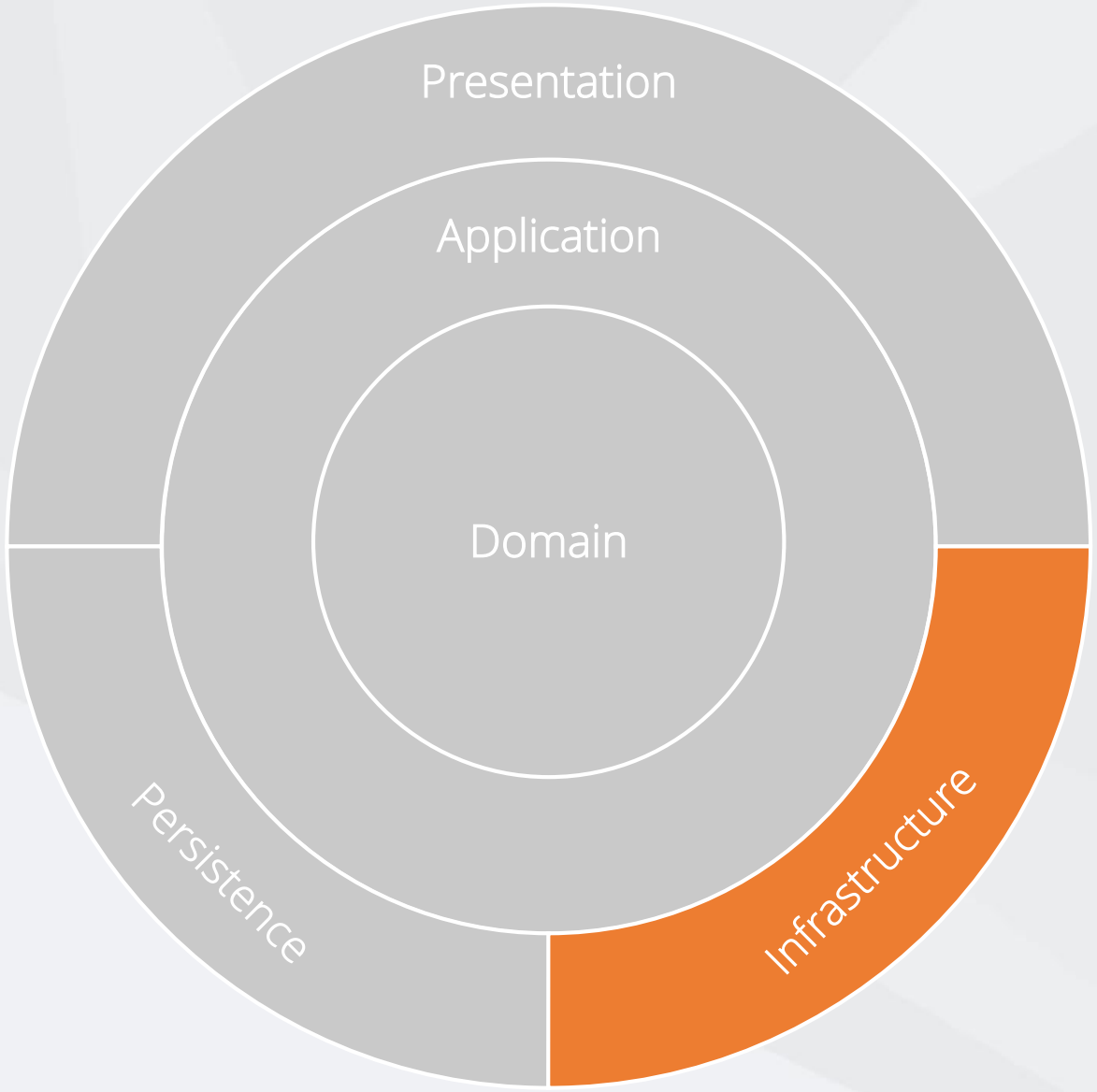
API Clients

File System

Email / SMS

System Clock

Anything external

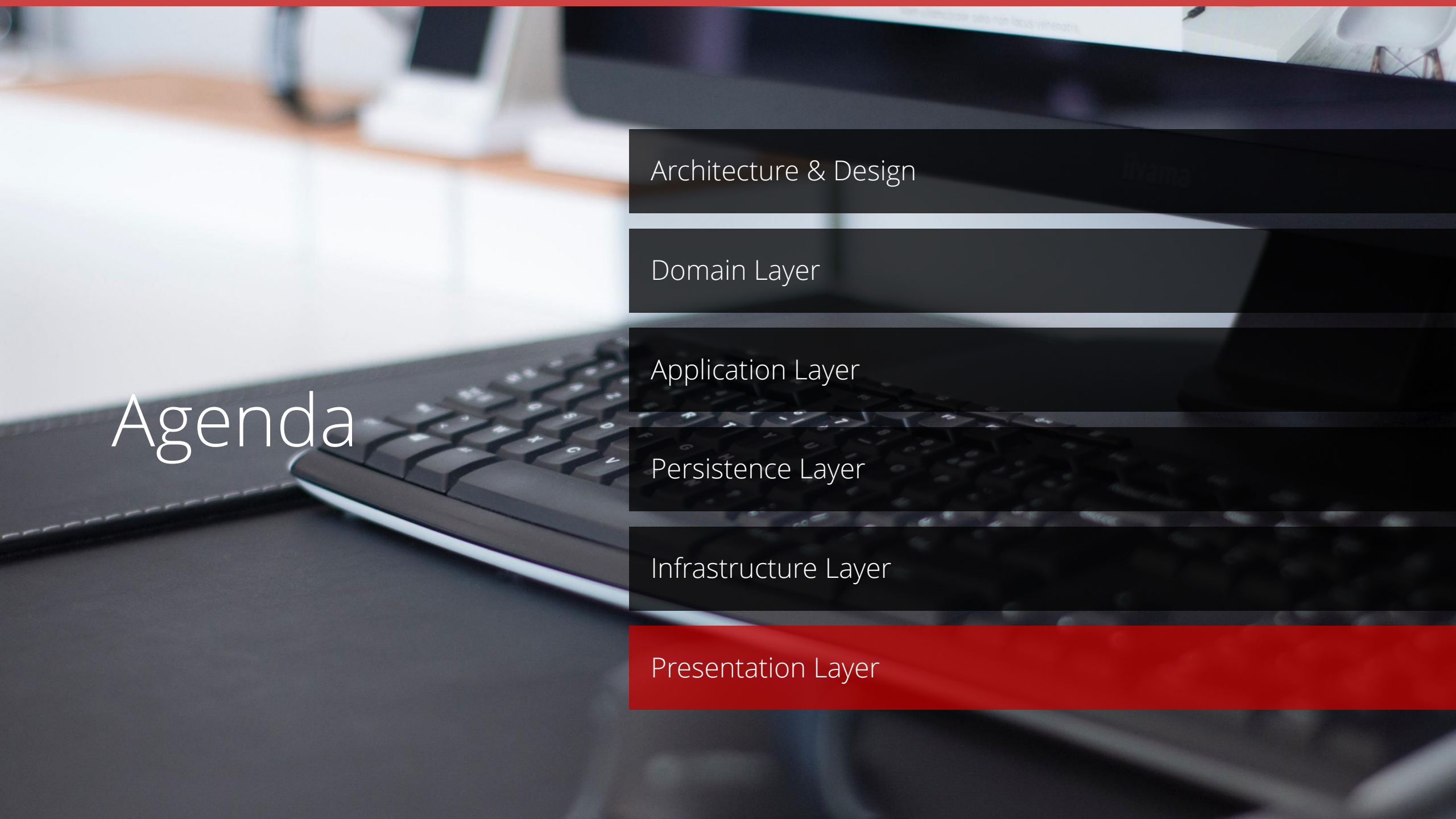


Demo

Reviewing the Infrastructure layer

Key Points

- Contains classes for accessing external resources
- Such as file systems, web services, SMTP and so on
- Implements abstractions / interfaces defined within the Application layer
- No layers depend on Infrastructure layer, e.g. Presentation layer



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Overview

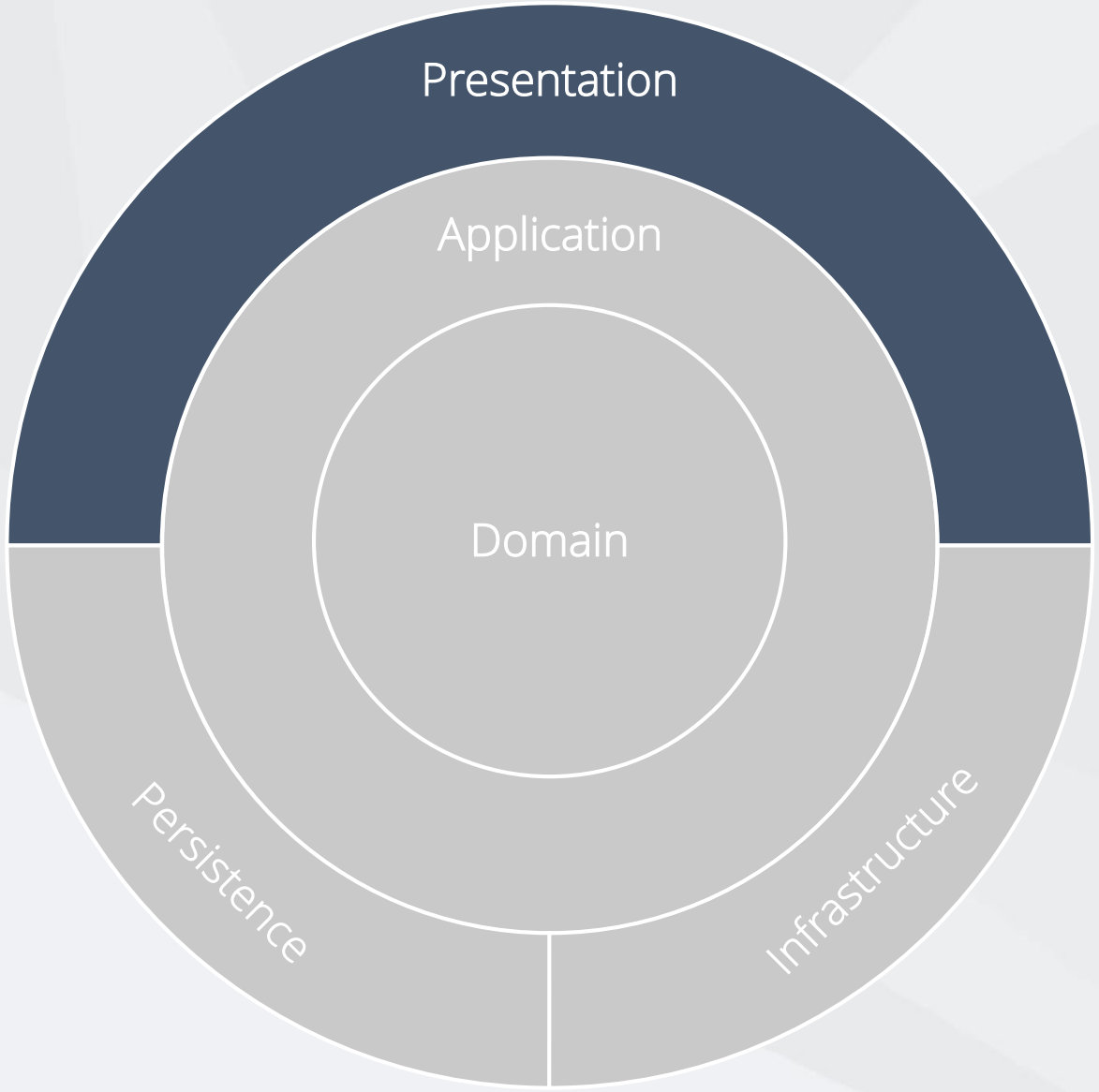
SPA – Angular or React

Web API

Razor Pages

MVC

Web Forms



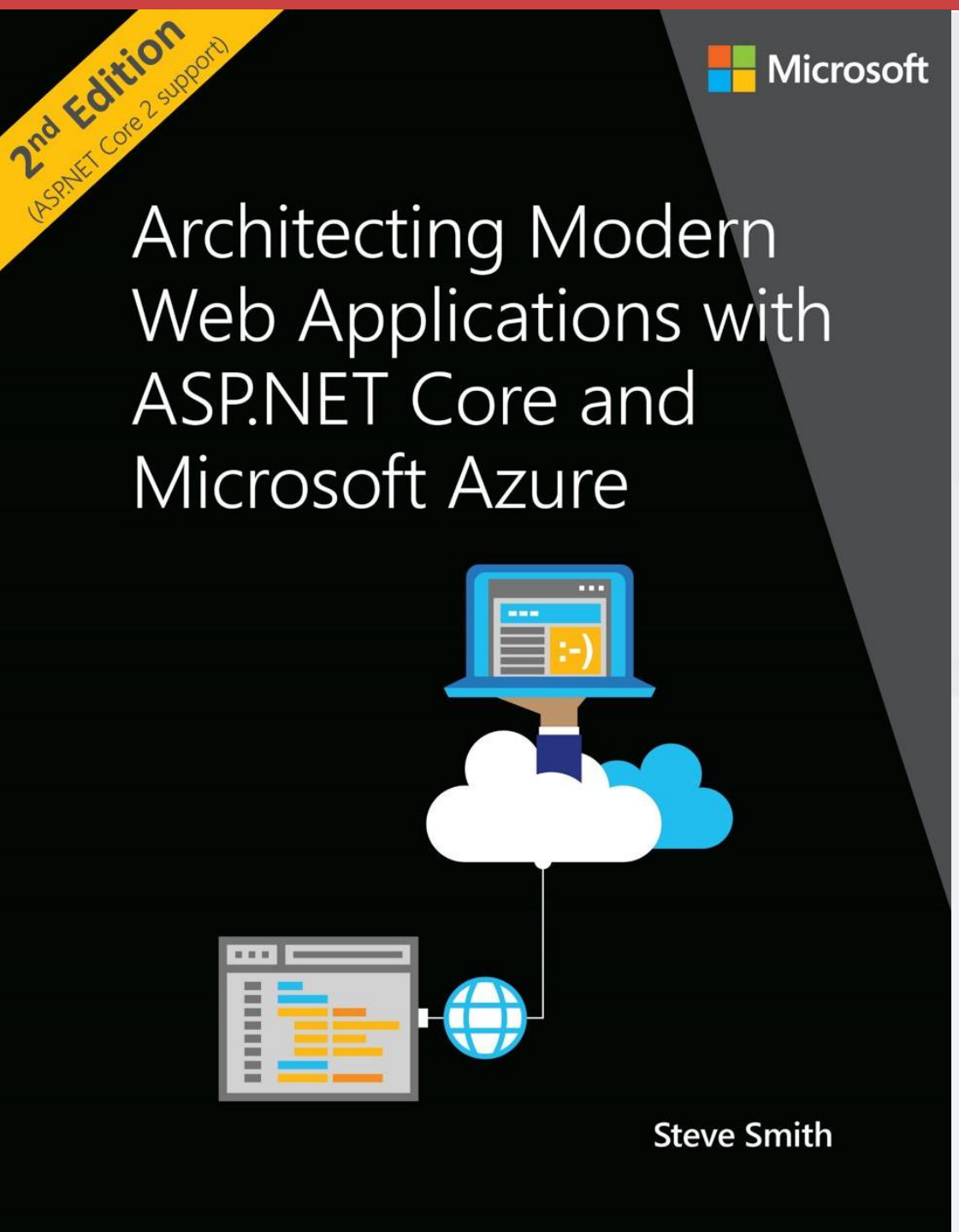
Demo

Reviewing the Presentation layer

Key Points

- Controllers should not contain any application logic
- Create and consume well defined view models
- Utilising Open API bridges the gap between the front end and back end

Recommend Resources



Building Monoliths

Clean Architecture

Azure

Building Microservices

Microservices

Containers

DDD

Azure

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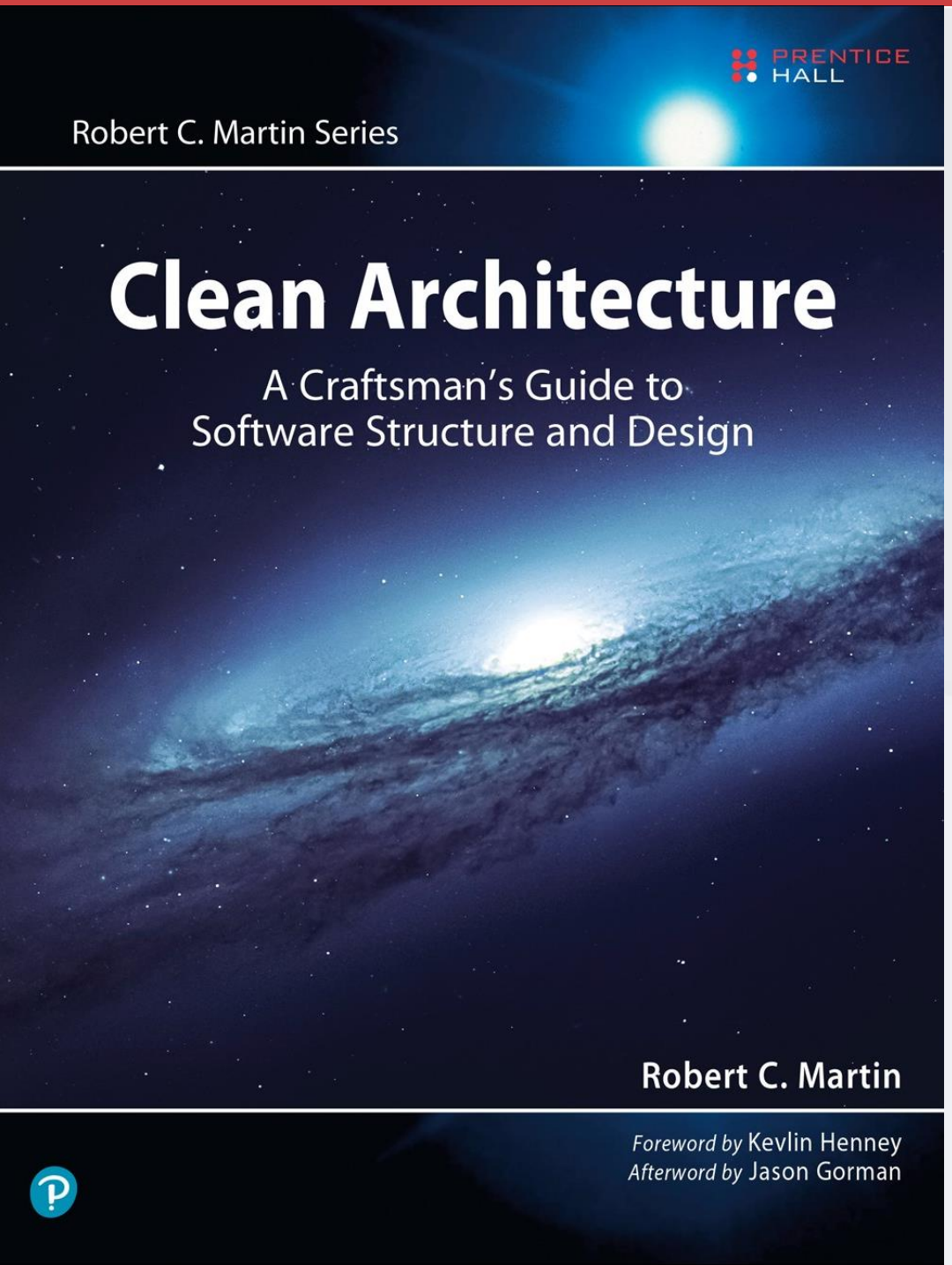

Clean Architecture

Robert C. Martin

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About the presenters

Jason Taylor

Jason is a passionate solution architect with over 16 years professional experience. He has worked with .NET since 2001, and currently specialises in teaching and developing enterprise applications utilising .NET Core, ASP.NET Core, EF

Next Steps

Code & Slides

bit.ly/northwind-traders

Get Started

Thank you!

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