Clean Architecture: Patterns, Practices, and Principles

INTRODUCTION

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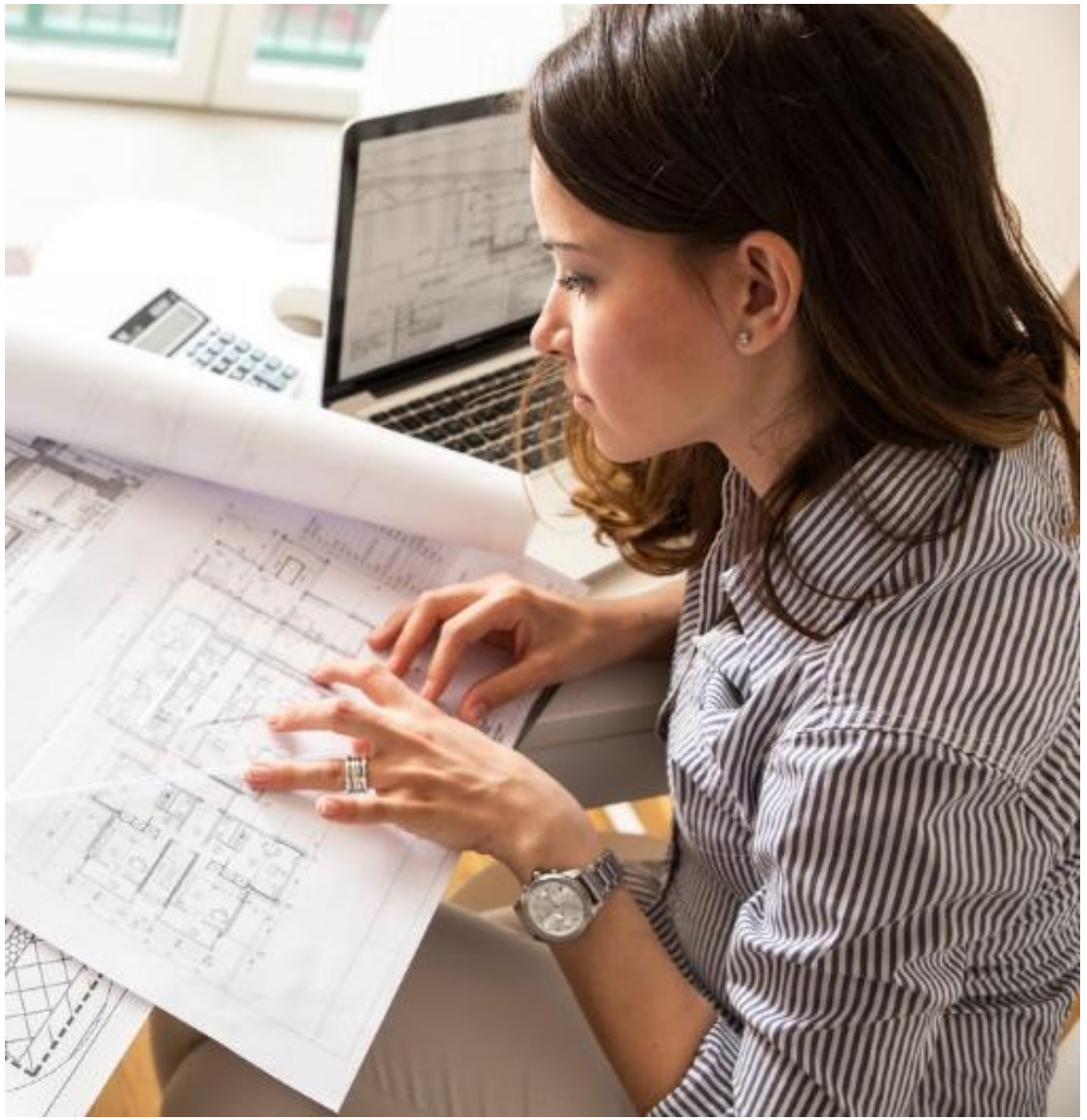


Course Overview

Clean Architecture

Domain-centric Architecture

Application Layer

Commands and Queries

Functional Organization

Microservices

Testable Architecture

Evolving the Architecture

Purpose

Philosophy of architectural essentialism

Set of patterns, practices, and principles

Alternative to traditional architecture

Focus

Enterprise applications

Agile architecture

Top 7 ideas

Audience

Developers

Architects

Prerequisites

Basic programming experience

Basic architecture experience

What Is Software Architecture?

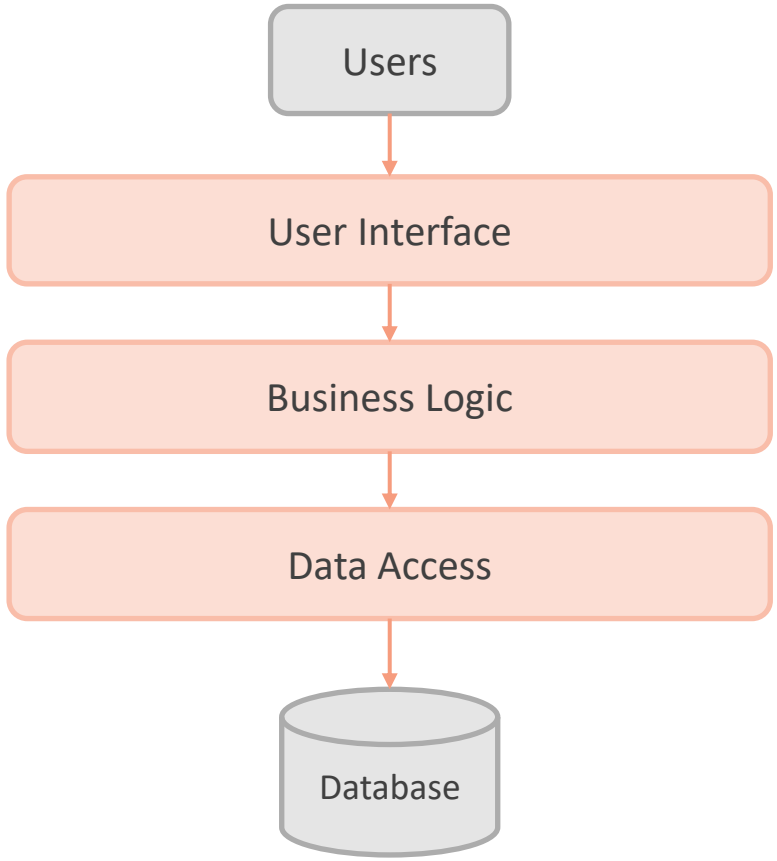
High-level

Structure

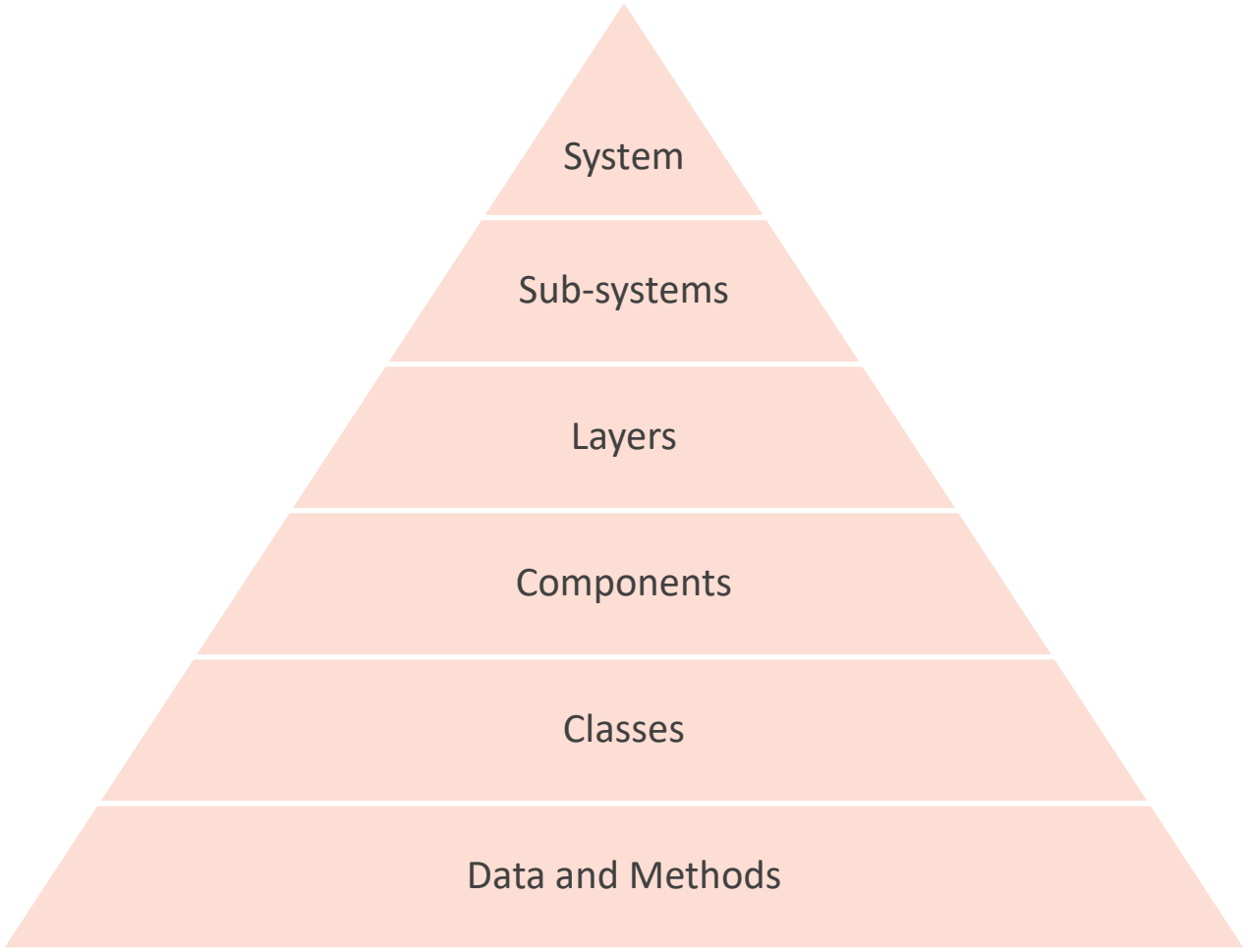
Layers

Components

Relationships



Levels of Architectural Abstraction



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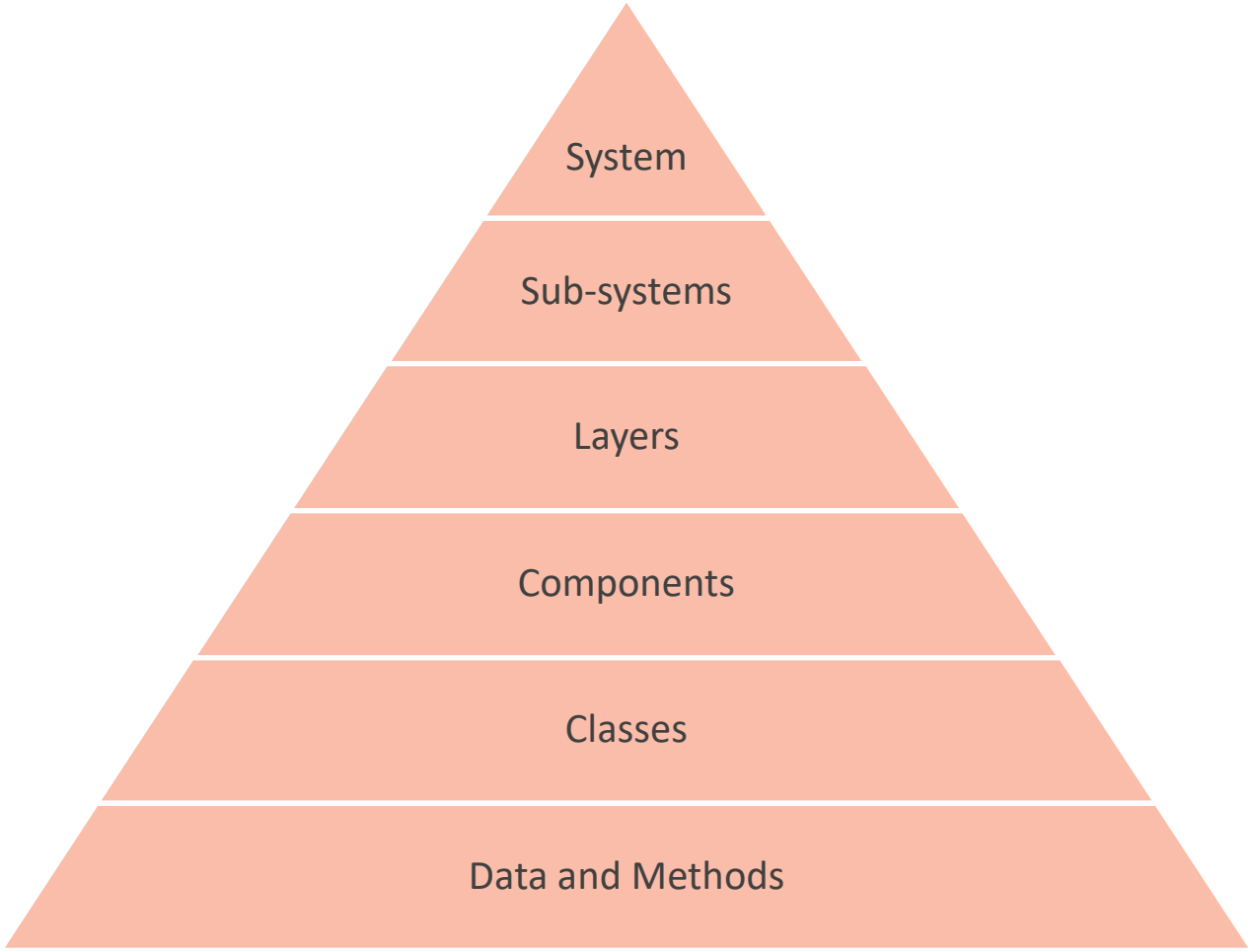


Messy vs. Clean Architecture

What Is Bad Architecture?

Complex

Incoherent

Rigid

Brittle

Untestable

Unmaintainable

What Is Good Architecture?

Simple

Understandable

Flexible

Emergent

Testable

Maintainable

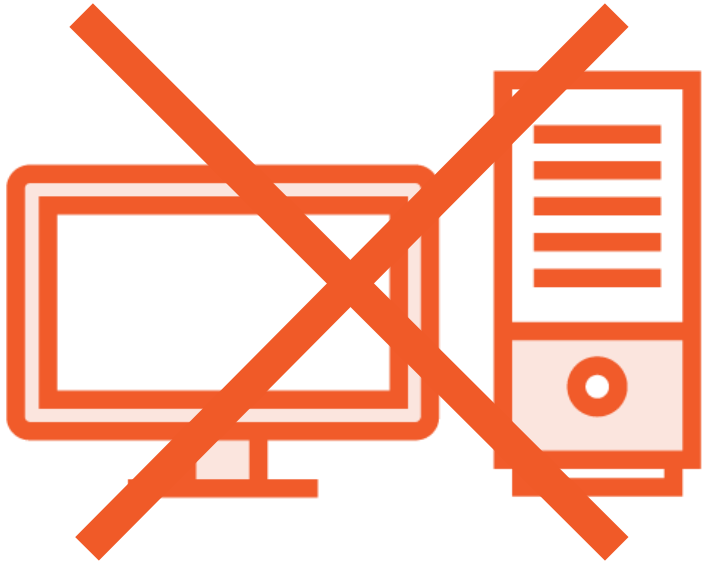
What Is Clean Architecture?

Architecture that is designed for
the inhabitants of the architecture…
not for the architect… or the machine

What Is Clean Architecture?

Inhabitants

Architect



Machine

What Is Clean Architecture?

Architecture that is designed for
the inhabitants of the architecture…
not for the architect… or the machine

Why Invest in Clean Architecture?

Cost/benefit

Minimize cost

Maximize value

Maximize ROI

Why Invest in Clean Architecture?

Focus on the essential

Build only what is necessary

Optimize for maintainability

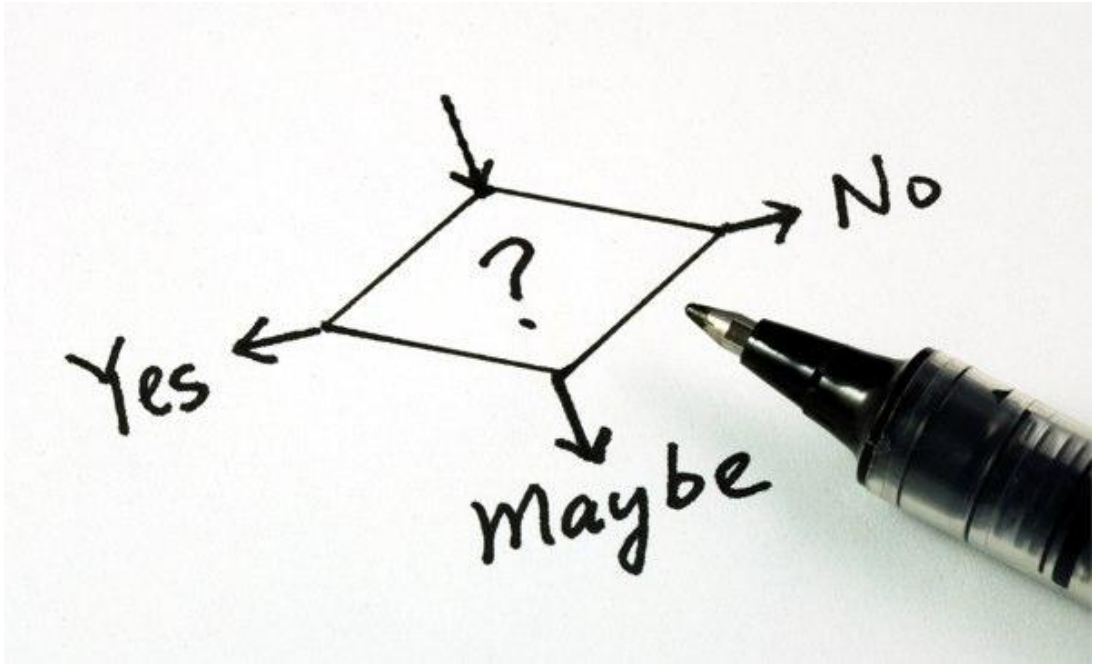
Decisions, Decisions, Decisions…

Context is king

All decisions are a tradeoff

Align with business goals

Use your best judgement



Setup

Demo the Application

Technologies

Visual Studio 2015

C# .NET 4.5

ASP.NET MVC 5

SQL Server 2014

Entity Framework 6

StructureMap 3.1

NUnit 2.5

Moq 4.2

AutoMoq 1.6

SpecFlow 2.1

Show the Solution

Show the Database

Open-source Demo Code

Pluralsight
http://www.pluralsight.com/library/courses/clean-architecture-patterns-practices-principles/exercise-file

GitHub
https://github.com/matthewrenze/clean-architecture-demo

Demo Technologies

Demo Technologies

General software architecture best practices …
not specific practices for a single technology stack

Demo Technologies

.NET Core 9.0

C# .NET 13.0

ASP.NET Core MVC 9.0

EF Core 9.0

Visual Studio 2022

SQL Server 2022

Scrutor 6.0

NUnit 4.3

Moq 4.20

SpecFlow 3.9

Alternate Versions

.NET 8.0

.NET 6.0

.NET 4.8

.NET 4.5

Alternate Versions

.NET 8.0

.NET 6.0

.NET 4.8

.NET 4.5

DB Set Adaptor

Repo and UoW

Alternate Versions

.NET 8.0

.NET 6.0

.NET 4.8

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DB Set Adaptor

Repo and UoW

https://github.com/matthewrenze/clean-architecture-demo

Summary

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Clean Architecture

Demo