Module 2: "SOLID in Practice"

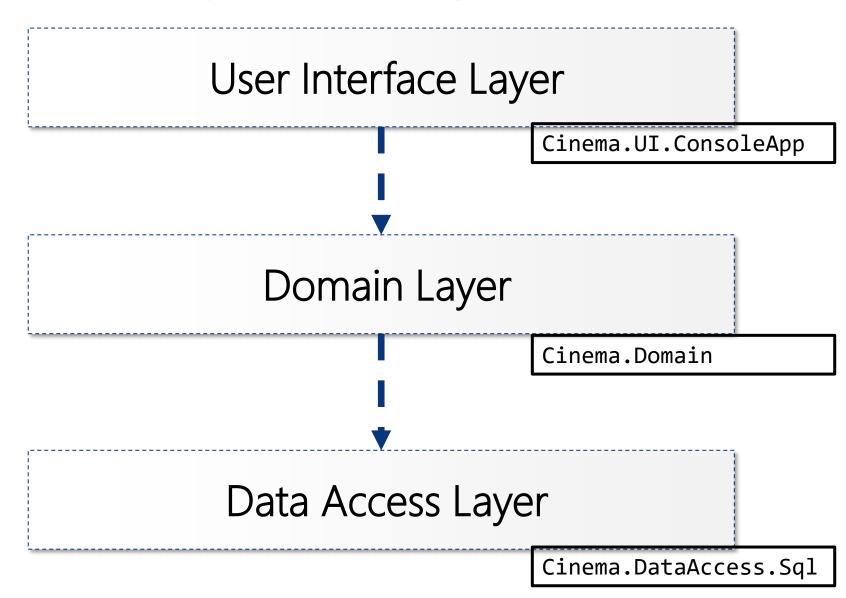




- Discussion: Evaluating the Design
- Pattern: Repository (with Entity Framework)
- Workshop A.2: Data Access Layer with Repository
- Discussion: Evaluating the Design Again
- (Optional) Automatic Testing
- Workshop A.3: Test Domain and Change Data Access



Beautiful Layered Design?





Discussion:

Evaluating the Design

- Can we change the UI Layer from Console to e.g. Web or WPF?
- Can we unit test the Domain Layer?
- Can we change the Data Access Layer?



Anti-Pattern: Entourage

When A depends upon B, and you group B and C in the same assembly, then if C depends upon D, in effect, you have equipped A with a dependency upon D.

Outline

- If you keep the interfaces and implementations in the same assembly, you essentially inherit dependencies' dependencies.
- Entourage means ask for one assembly and it gives all its assemblies.
- Nuget packages are potentially evil!

See:

"Adaptive Code" (2nd Edition) Gary McLean Hall (2017)



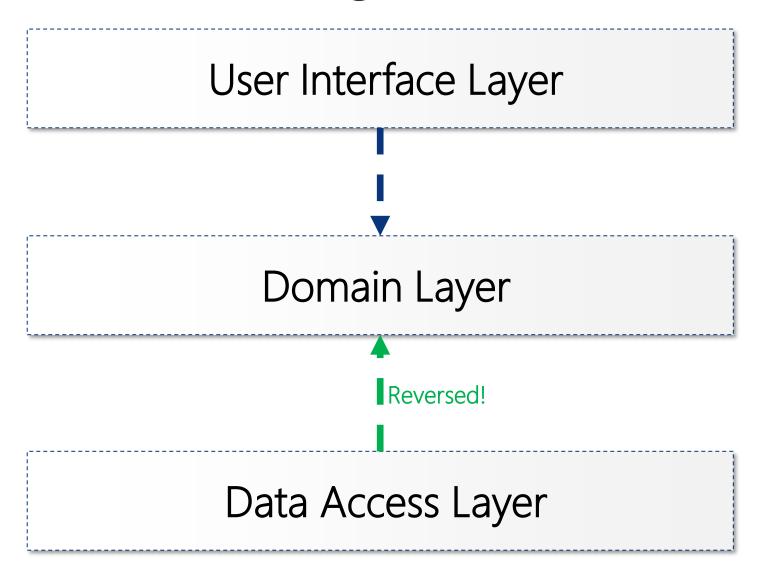
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Better SOLID Design





Workshop A.2: Data Access Layer with Repository





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Pattern: Stairway

- Let your implementation packages depend upon packages that exclusively contain interfaces (or interface-like classes). Moreover, your packages should not depend other implementation packages.
- Outline
 - This is essentially the "module" part of DIP
 - Avoids the Entourage anti-pattern
 - May not always be practically manageable
- See:

"Adaptive Code" (2nd Edition) Gary McLean Hall (2017)



Implications of Stairway

- Keep the interfaces and implementations in the different assemblies
 - Can vary the two independently
 - clients only need to make a single reference—to the interface assembly.
- Interfaces should not have any external dependencies
 - As far as possible, this should always be adhered to
- Interfaces should not have methods or properties that expose any data objects or classes defined in thirdparty references
 - A reference to infrastructural entities (i.e. third-party dependencies) should be avoided.



Unfortunately...

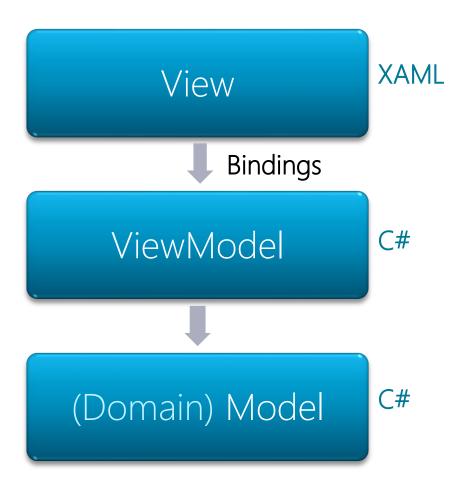
Third party library such as Log4Net, NHibernate, and MongoDB are packaged using the Entourage antipattern.

Solution:

To work around the above issue, make use of a simple interface that hides the third-party dependency behind a first-party dependency and an adapter



Pattern: Model-View-ViewModel



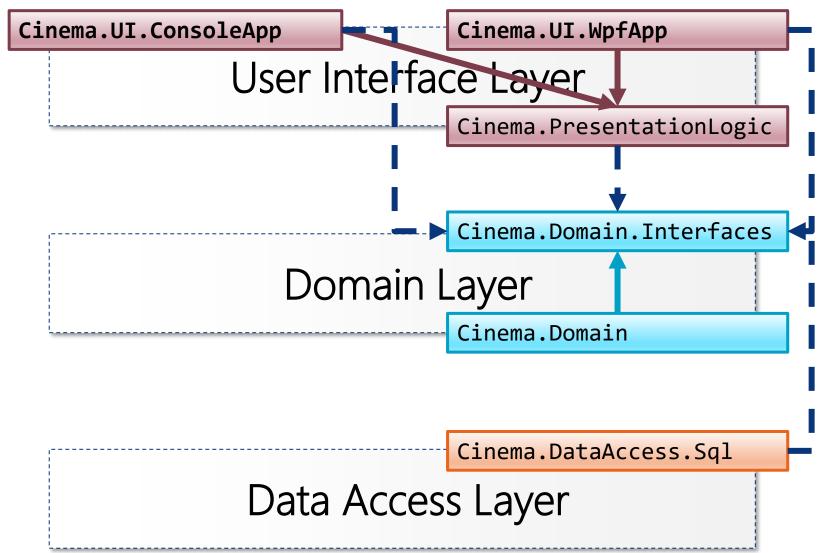
 Separation between presentation and application logic

The ViewModel is an abstraction of the View

 Depends heavily on data binding and command binding



Stairway Design



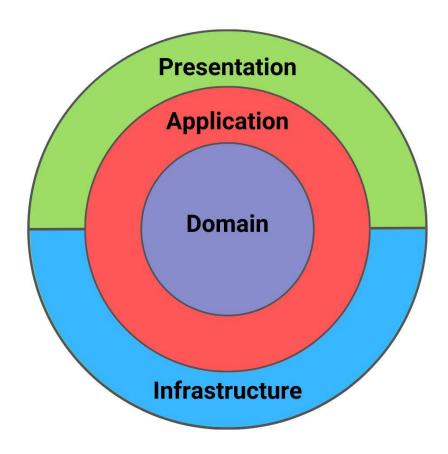


Architectural Principles in Summary

- ▶ Ports and Adapters a.k.a. Hexagonal Architecture
 - Alistair Cockburn (2005)
 - https://alistair.cockburn.us/hexagonal-architecture/
- Onion Architecture
 - Jeffrey Palermo (2008)
 - https://jeffreypalermo.com/2008/07/the-onion-architecture-part-1/
- ▶ Clean Architecture a.k.a. Screaming Architecture
 - Robert C. Martin (2012)
 - https://blog.cleancoder.com/uncle-bob/2012/08/13/the-clean-architecture.html

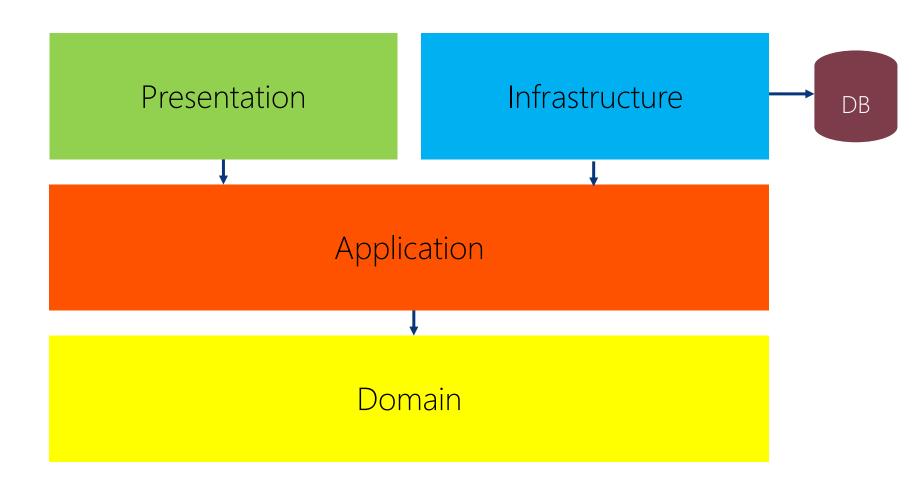


Usually Presented as...



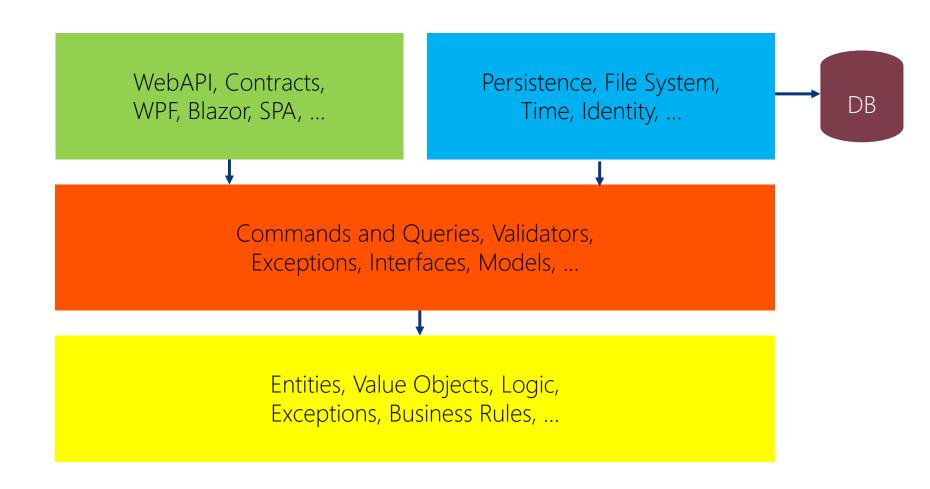


Clean Architecture





A More Detailed Look Inside





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Workshop A.3: Change the Data Access Layer





Summary

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