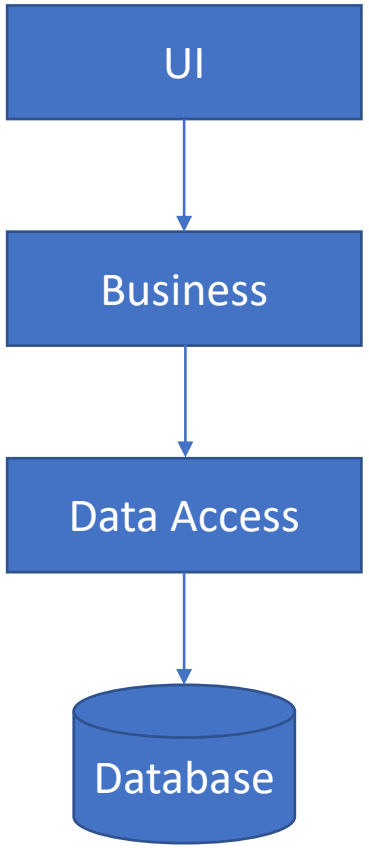
Ports and Adapters Architecture

Ports and adapters - Intent

- “Allow an application to equally be driven by users, programs, automated test or batch scripts, and to be developed and tested in isolation from its eventual run-time devices and databases.”

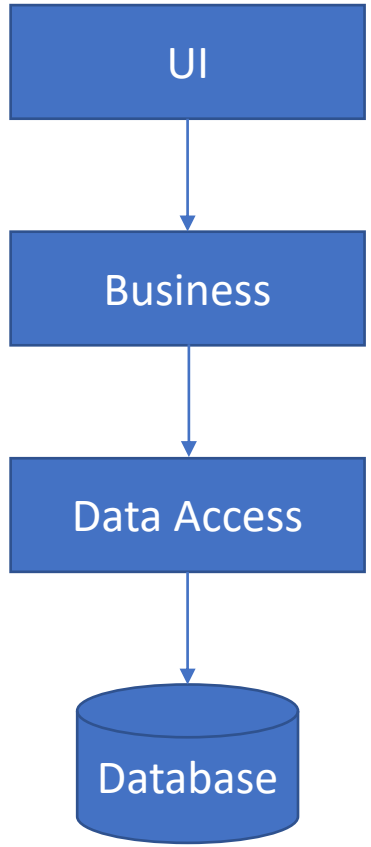
Source: https://alistair.cockburn.us/hexagonal-architecture/

N-Tier / Layer architecture



Problems with layers

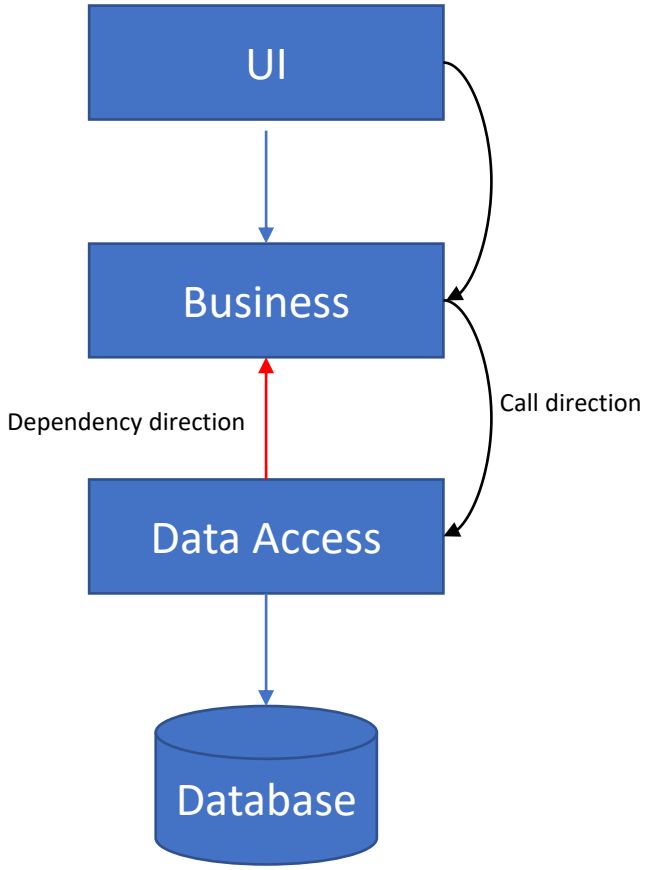
- Easy to fall into database driven design
- Coupling
- Testing

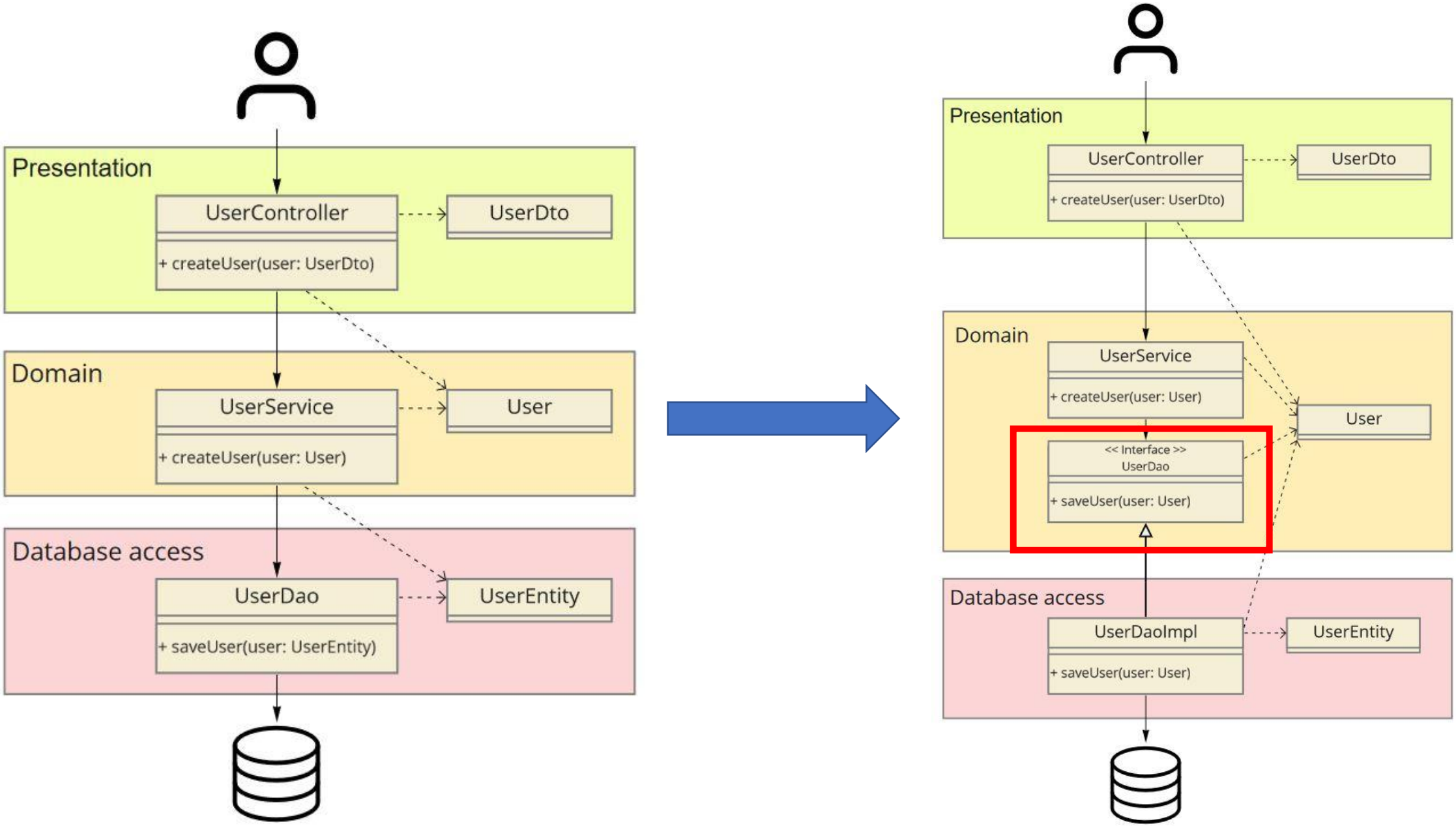


Dependency inversion

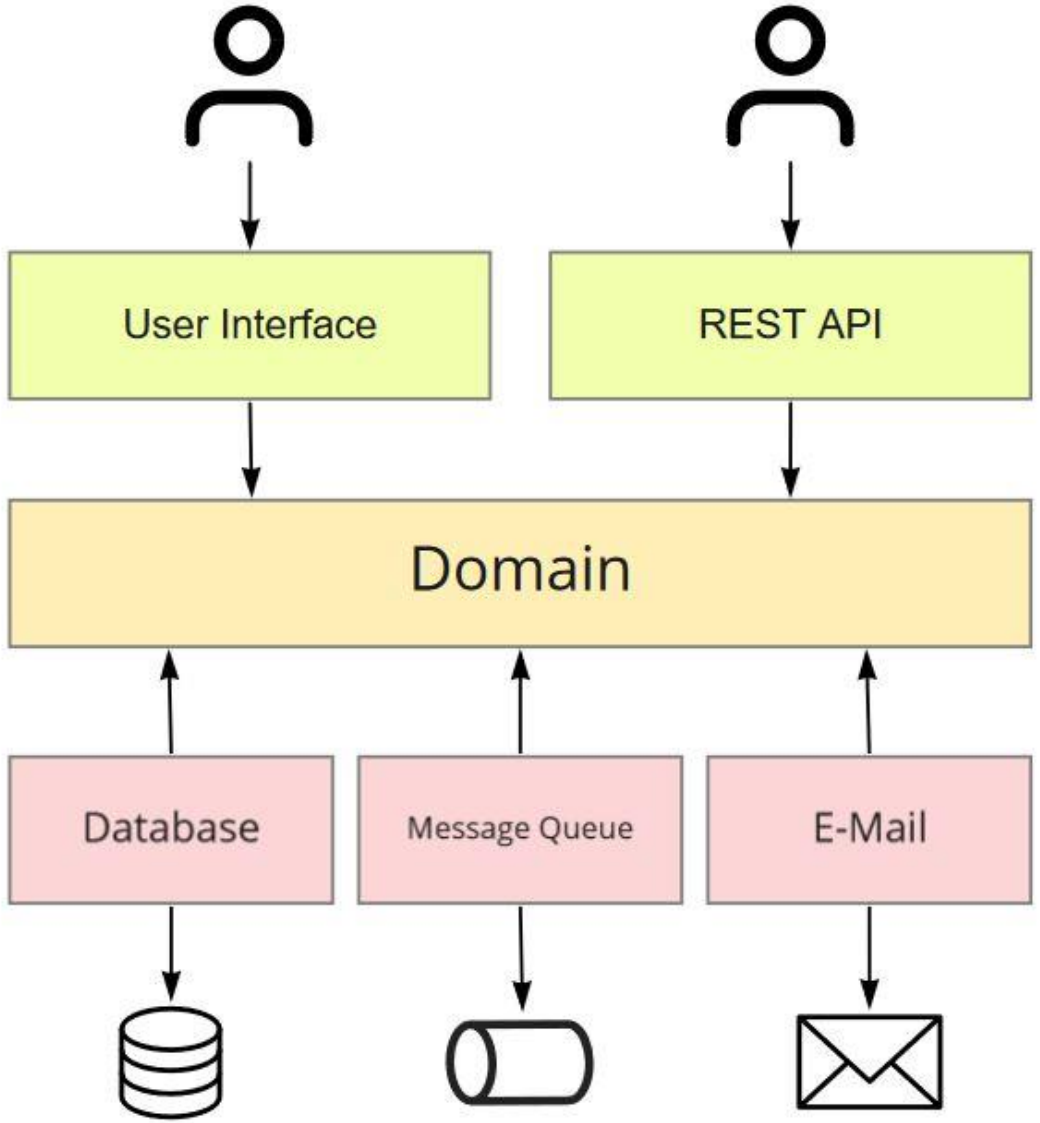
- High-level modules should not depend on low-level modules. Both should depend on abstractions.
- Abstractions should not depend upon details
- Details should depend upon abstractions

- Use interfaces and inject a concrete implementation





Source: https://www.mscharhag.com/architecture/layer-onion-hexagonal-architecture



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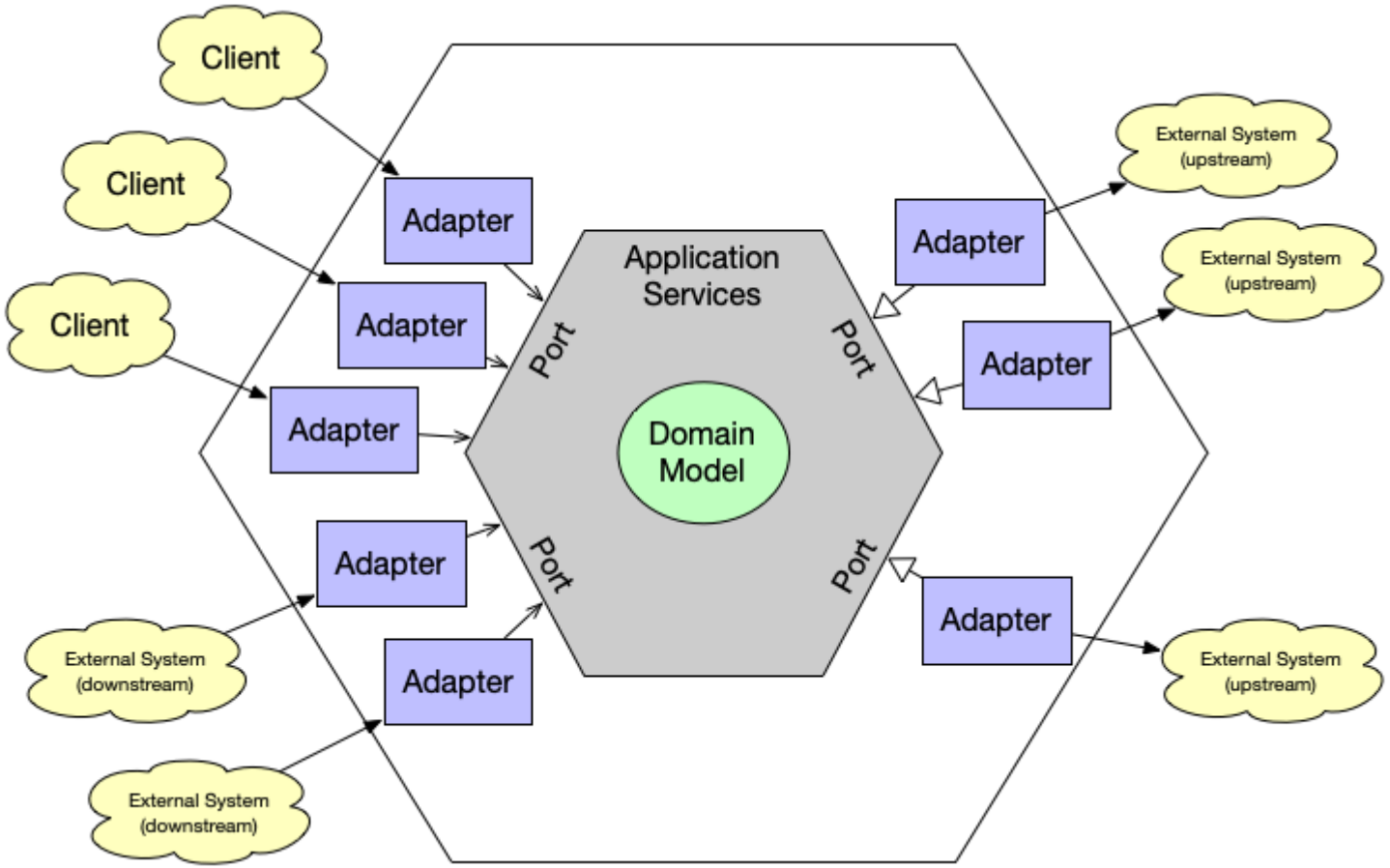
Ports and adapters



Source: https://vaadin.com/blog/ddd-part-3-domain-driven-design-and-the-hexagonal-architecture

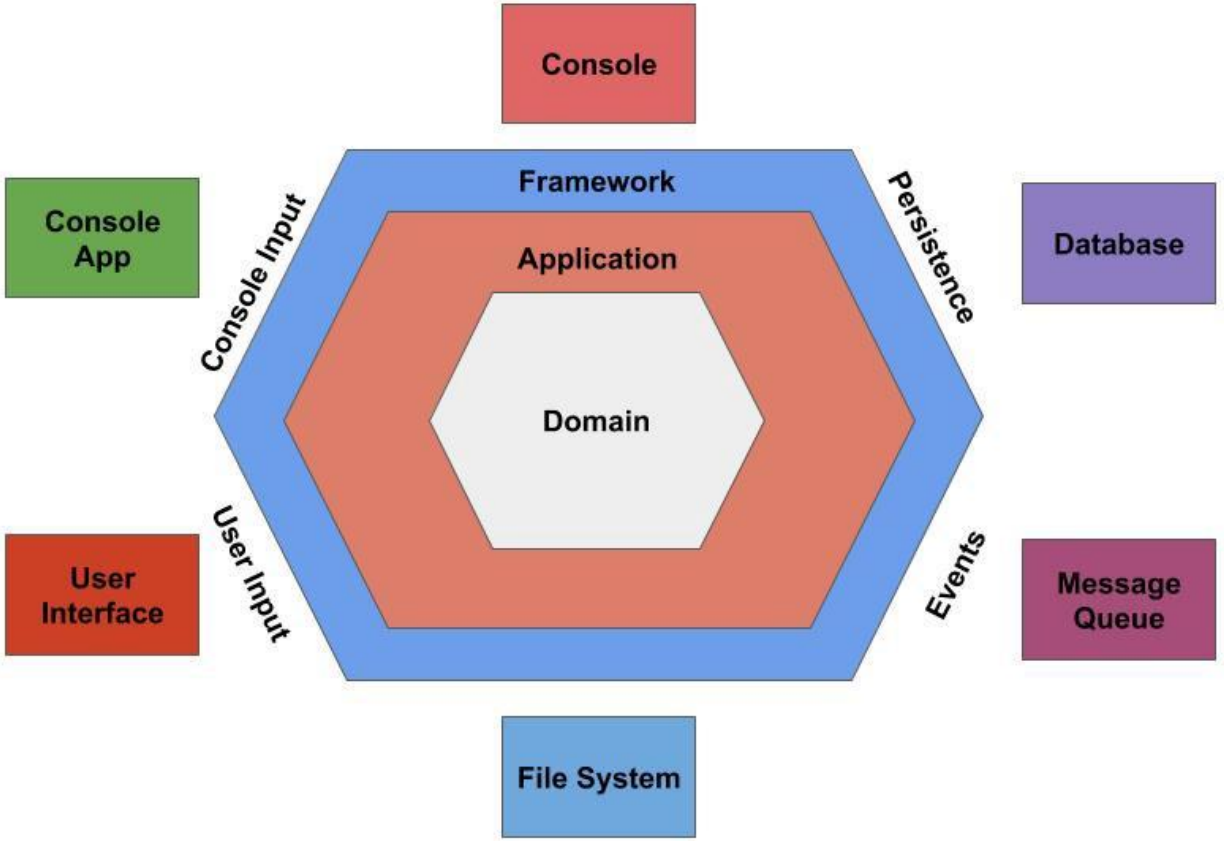
What is a port?

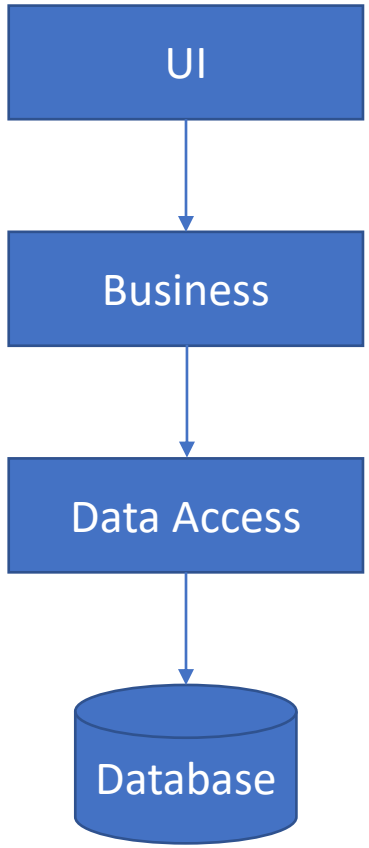
- A port is an interface, a contract
- You may plug in anything that fits the port
- In C# it is an interface

What is an adapter?

- An adapter transforms a request so it fits the port
- Many adapters for a single port
- In C#, this is a class implementing an interface (the port)

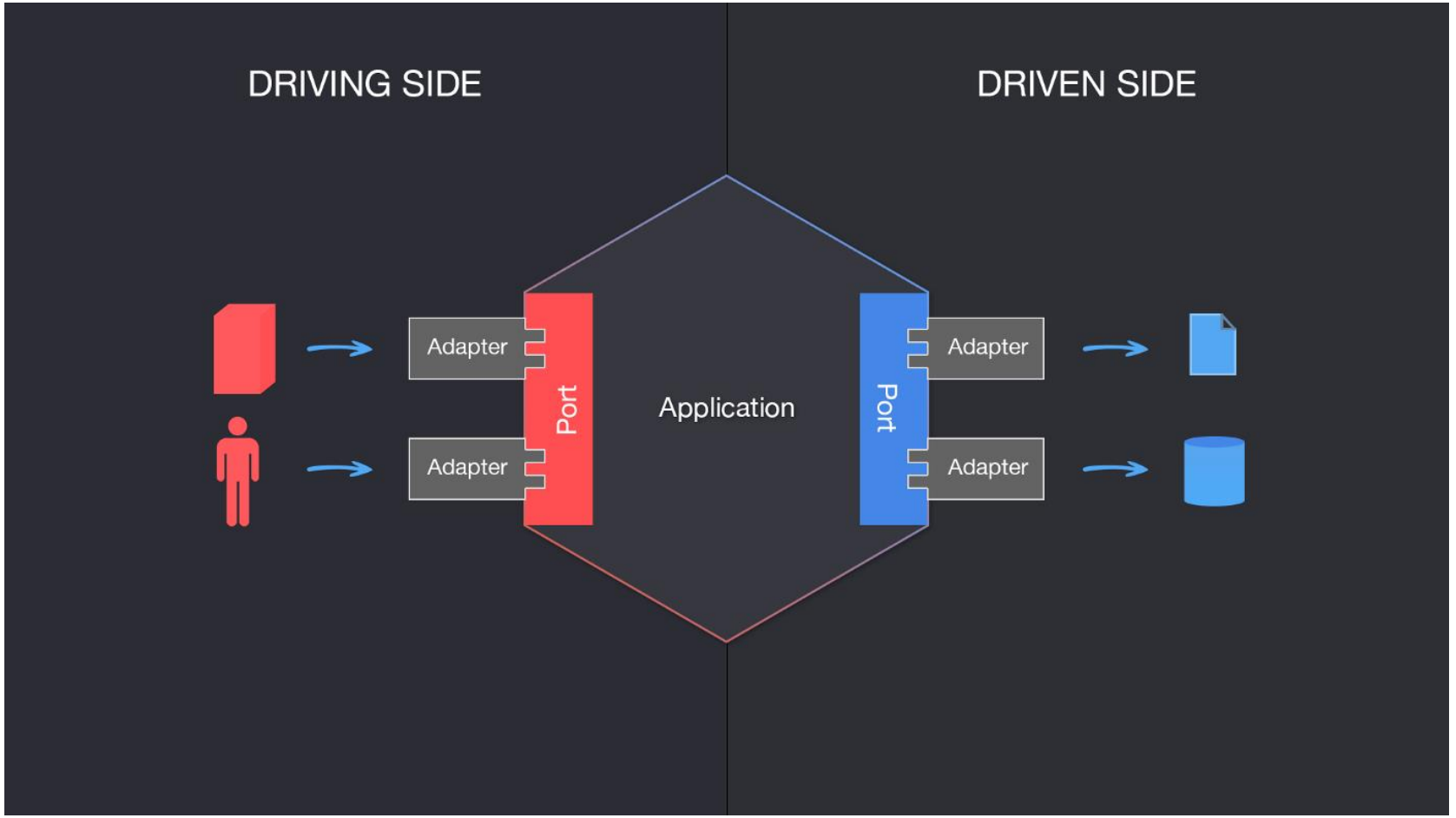
A new order





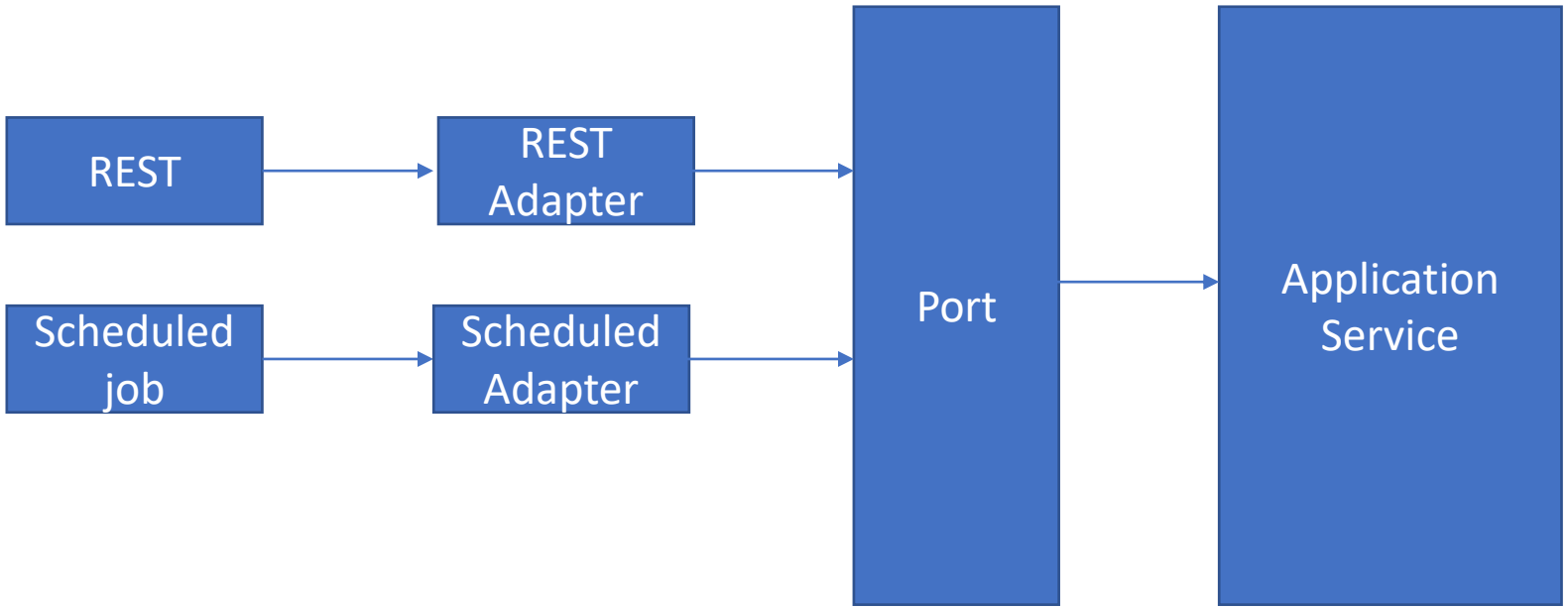
Source: https://medium.com/ssense-tech/hexagonal-architecture-there-are-always-two-sides-to-every-story-bc0780ed7d9c

Driving and driven side

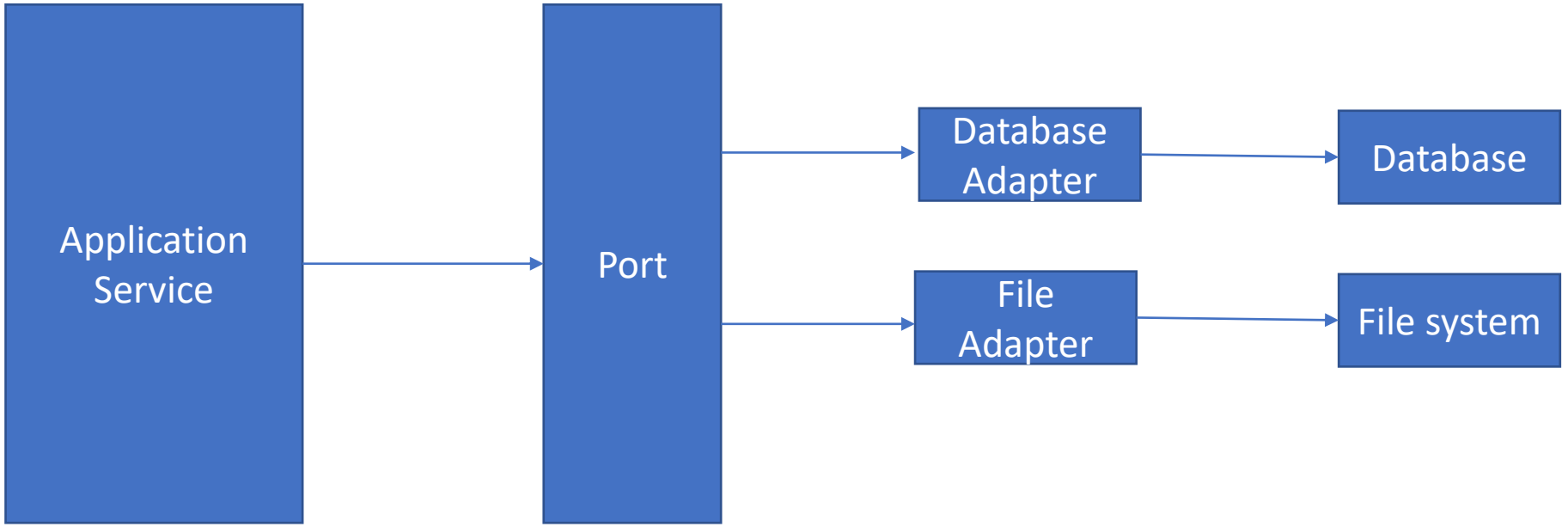


Source: https://medium.com/ssense-tech/hexagonal-architecture-there-are-always-two-sides-to-every-story-bc0780ed7d9c

Driving side



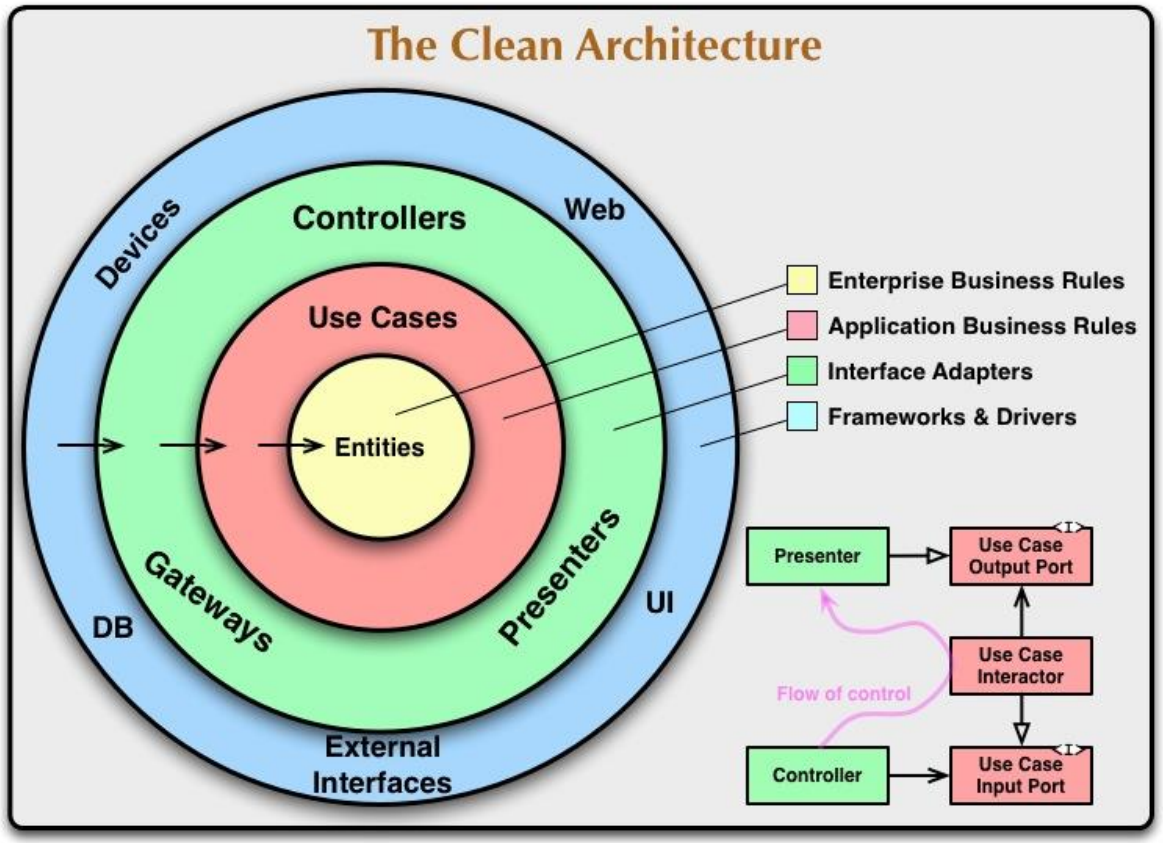
Driven side


Application Service
Port
Database Adapter
Database
File Adapter
File system

Automated testing

- Makes it easy to use test doubles
- It’s just another adapter to plug into a port
- Makes it easy to write tests
- Allows test-driving application

Clean Architecture / Onion Architecture



Source:https://blog.cleancoder.com/uncle-bob/2012/08/13/the-clean-architecture.html

Advantages of Ports and adapters

- Allows us to keep the application isolated from the implementation details
- Puts the domain at the center
- Focus on the feature instead of the technical details
- Delay choices on technical implementation
- Prevents vendor lock-in, and makes it easier for your application's tech stack to evolve with time
- Enables us to really test our application in isolation from external dependencies.

Questions?