Embracing Clean Architecture

in Spring Boot with Kotlin

Łukasz Pięta

Senior Software Engineer @ OLX

Kotlin passionate

DDD enthusiast

GitHub: @pientaa

Medium: @pientaa

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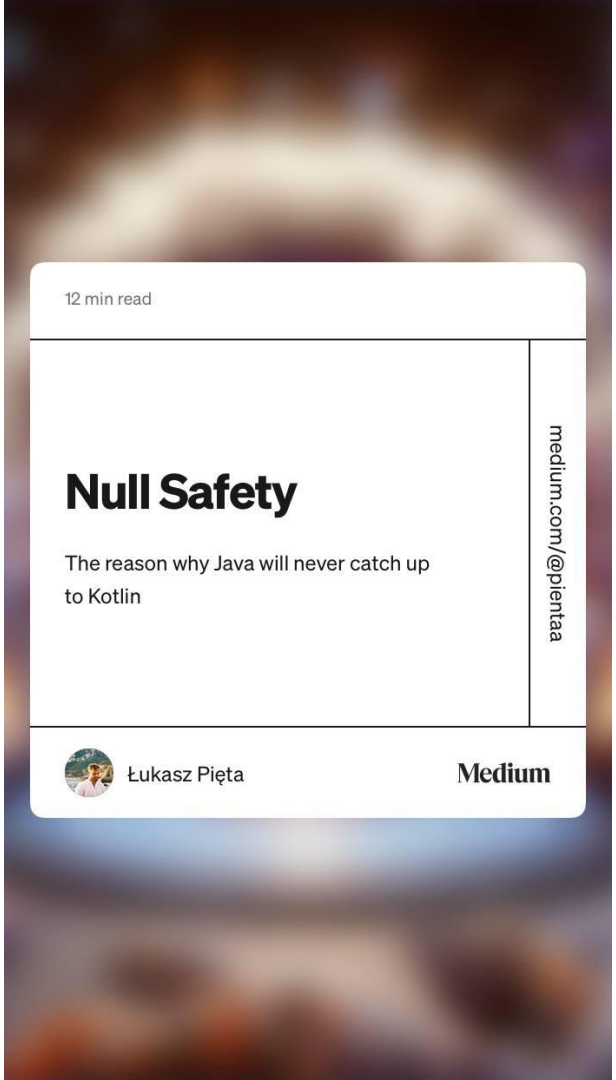
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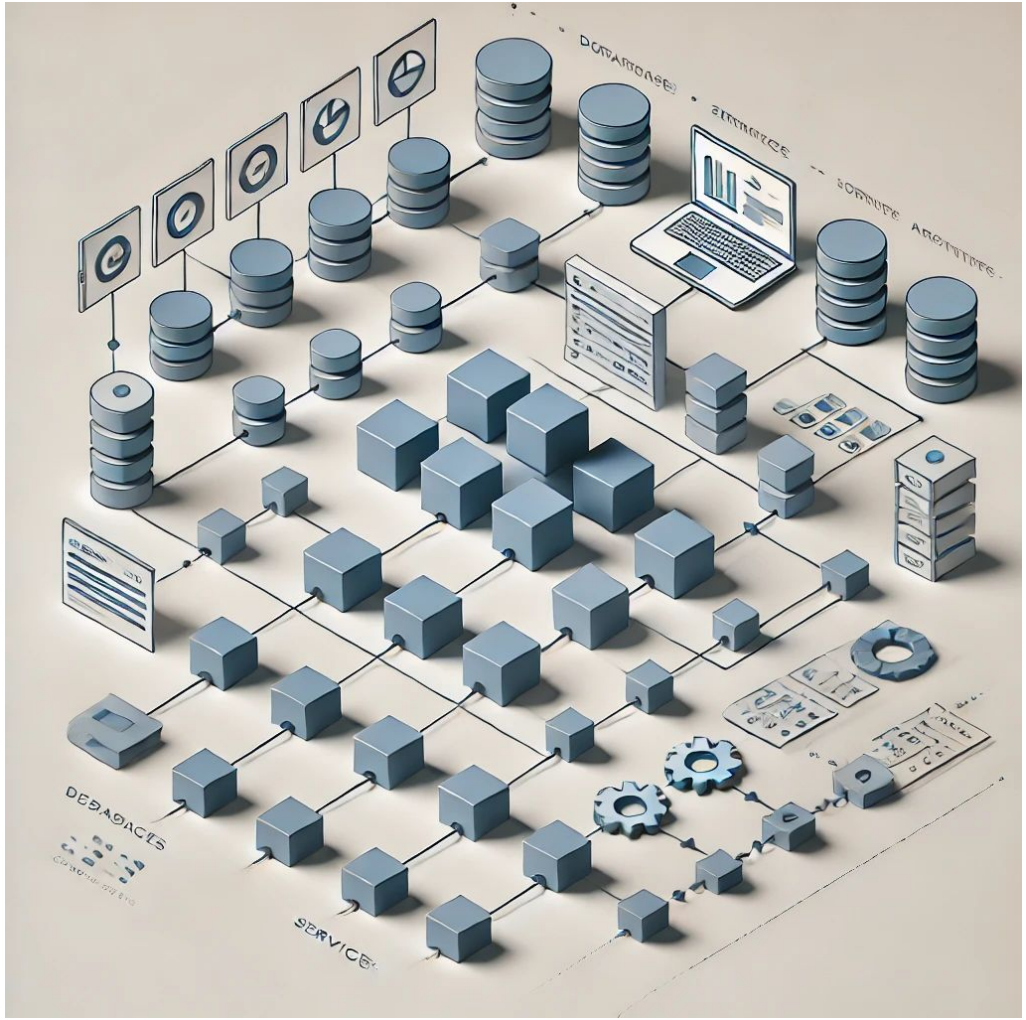
Software architecture



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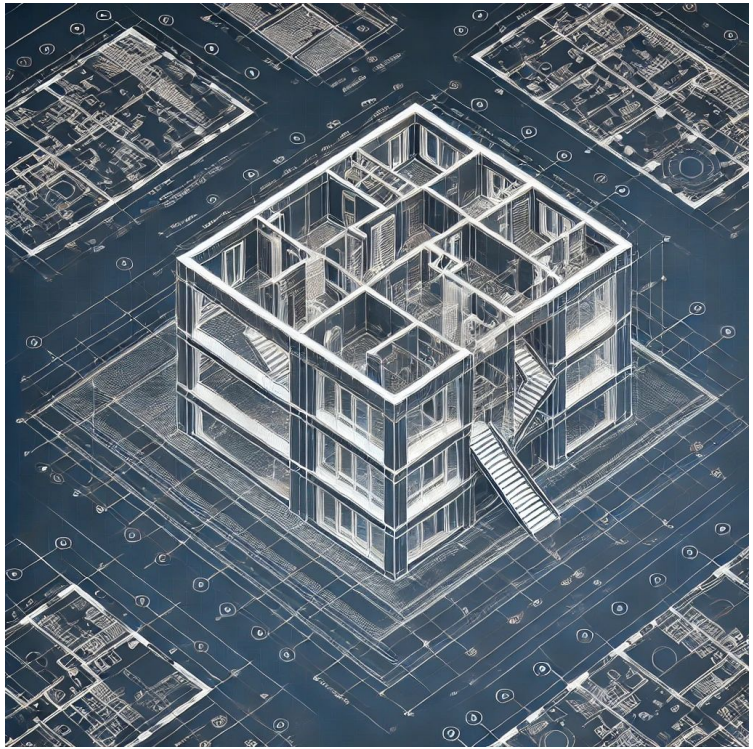
“Architecture” metaphor



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“The set of **significant decisions** about the **organization of a software system**, including the choice of structural elements and their interfaces.”

~ Martin Fowler

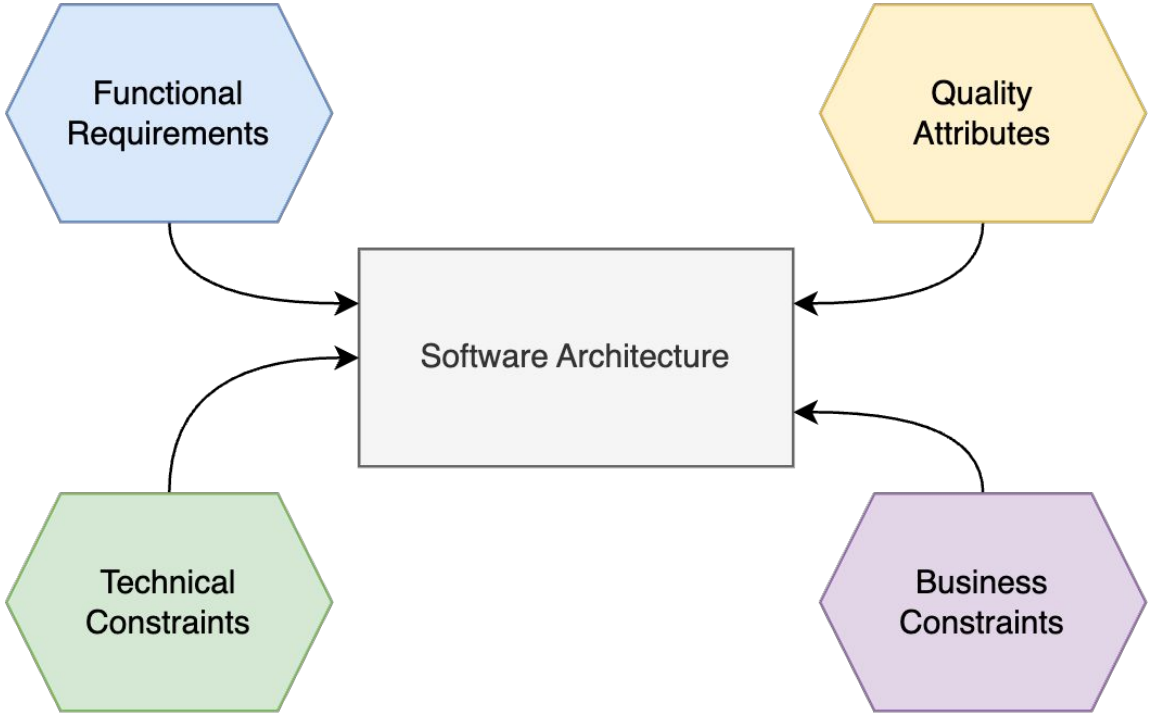
“Architecture is about **the important stuff**. Whatever that is.”

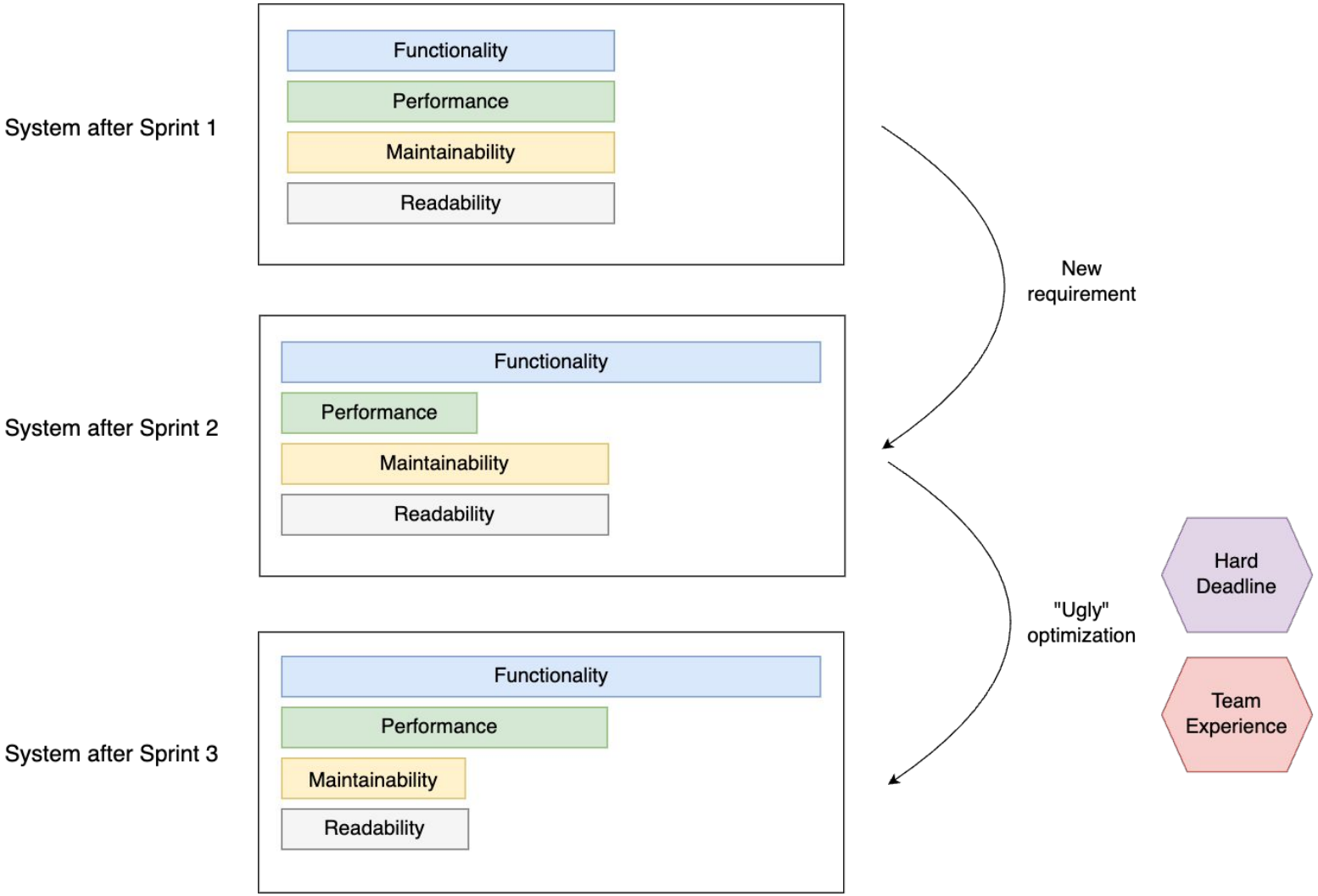
~ Ralph Johnson

Architectural Drivers

"Set of common things that really drive, influence and shape the resulting software architecture"

~ Simon Brown




System after Sprint 1
Functionality
Performance
Maintainability
Readability
New requirement
System after Sprint 2
Functionality
Performance
Maintainability
Readability
"Ugly" optimization
Hard Deadline
Team Experience
System after Sprint 3
Functionality
Performance
Maintainability
Readability


TRADE-OFFS
LIGHTYEAR
TRADE-OFFS EVERYWHERE
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Software Architect Toolbox

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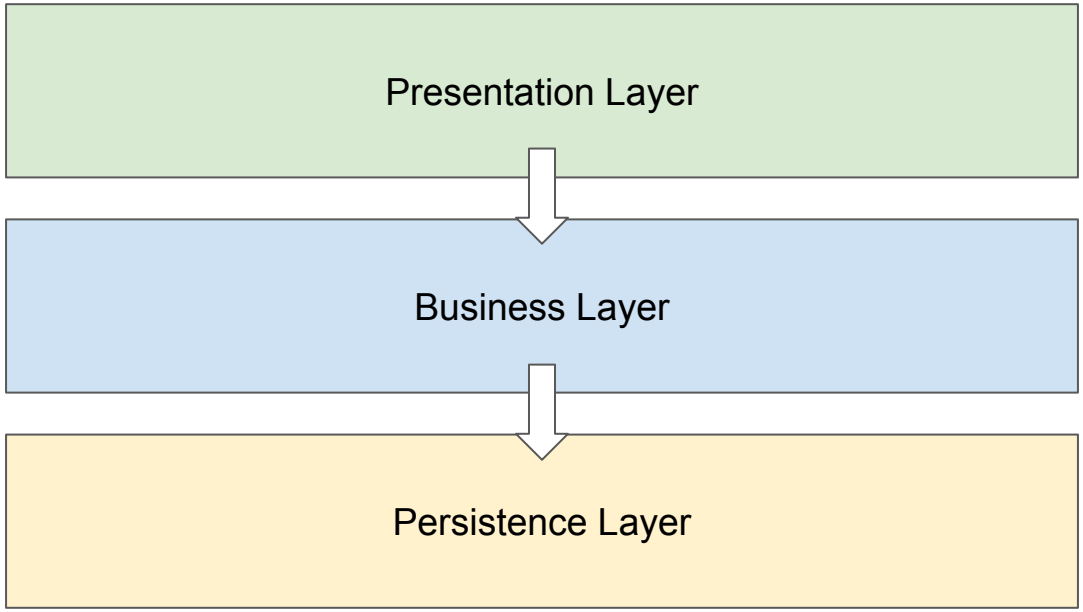
Layered architecture



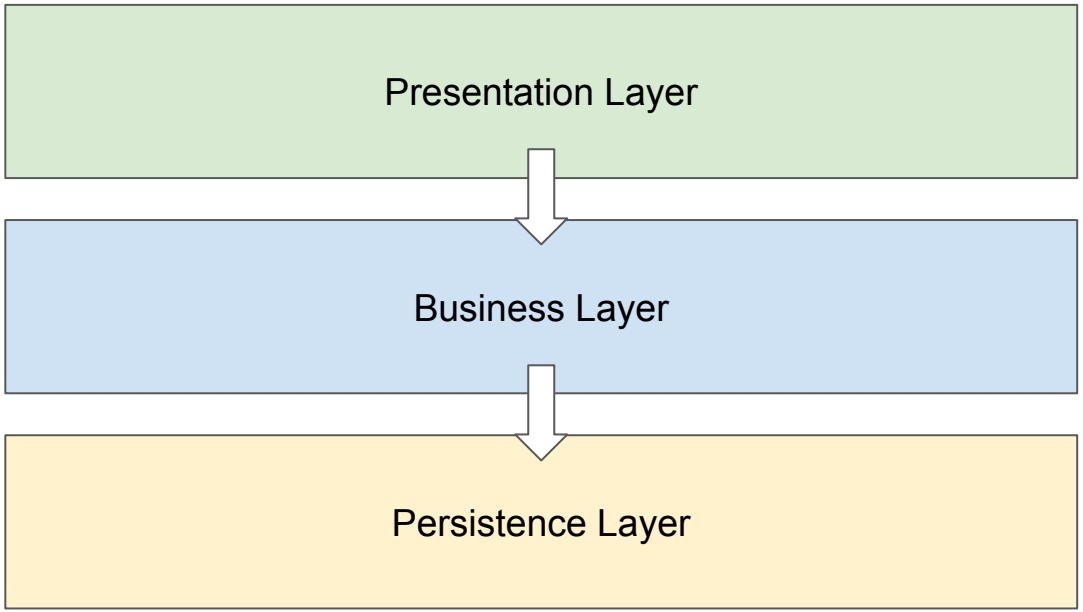
Layered architecture

Pros:

- Just simple

Cons:

- Tight coupling
- Maintainability rapidly decreasing with increasing complexity



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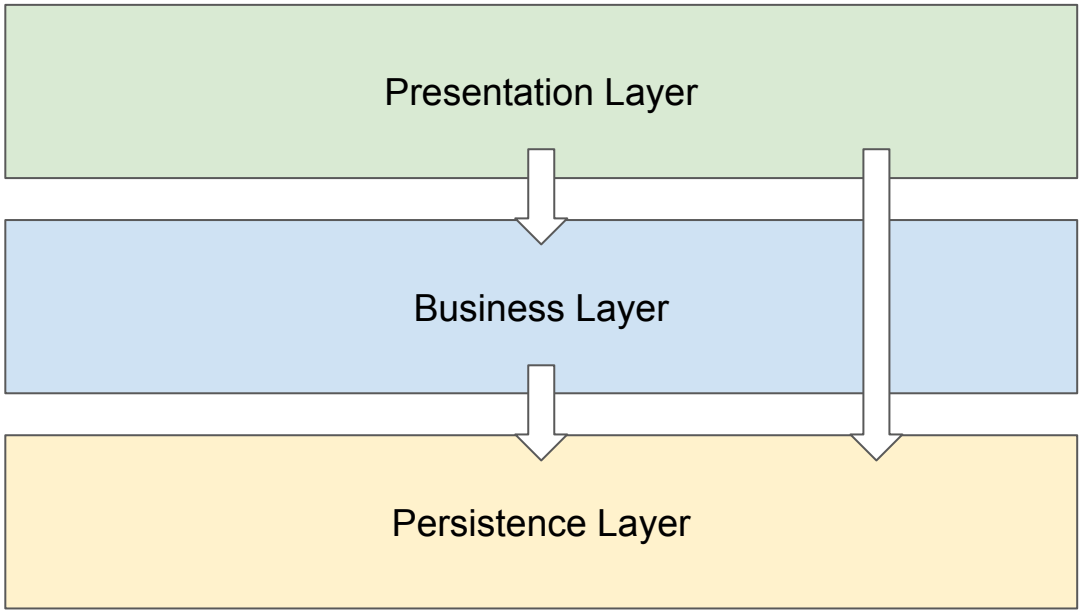


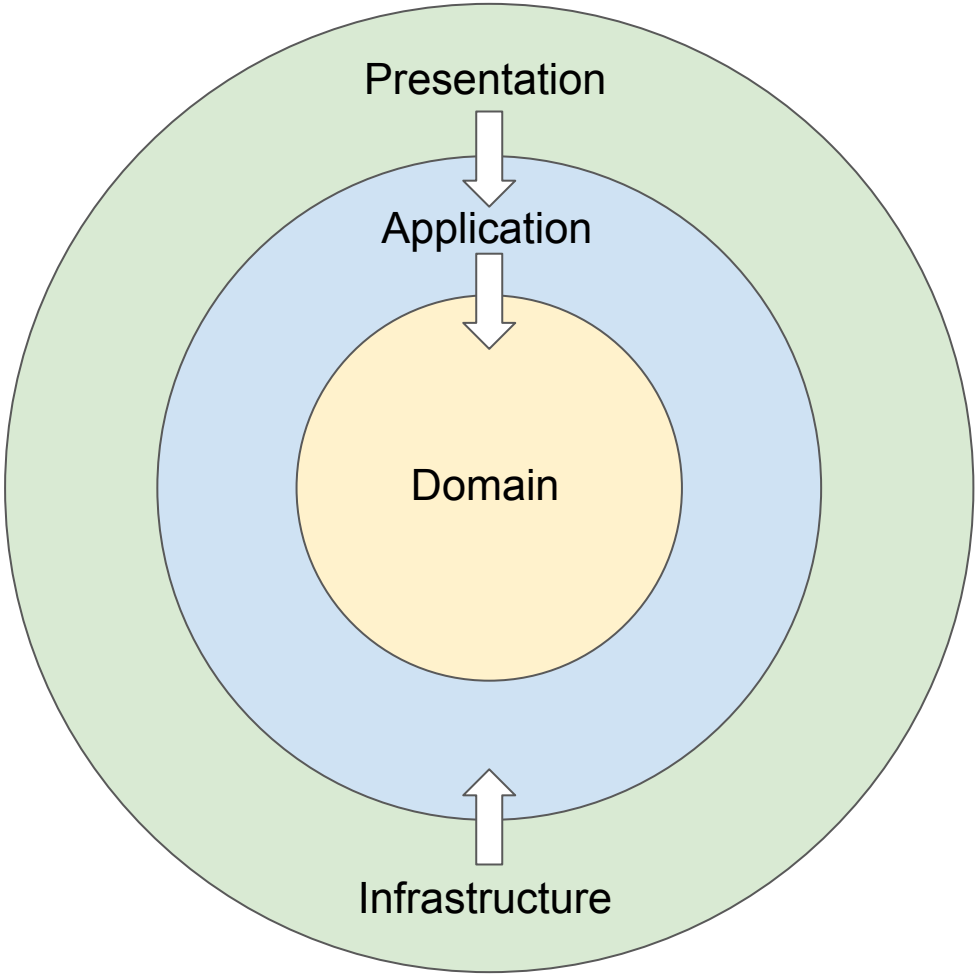
Onion architecture

Pros:

- Testability
- Separation of Concerns
- Flexibility

Cons:

- Initial Complexity
- Learning Curve
- Increased Boilerplate Code



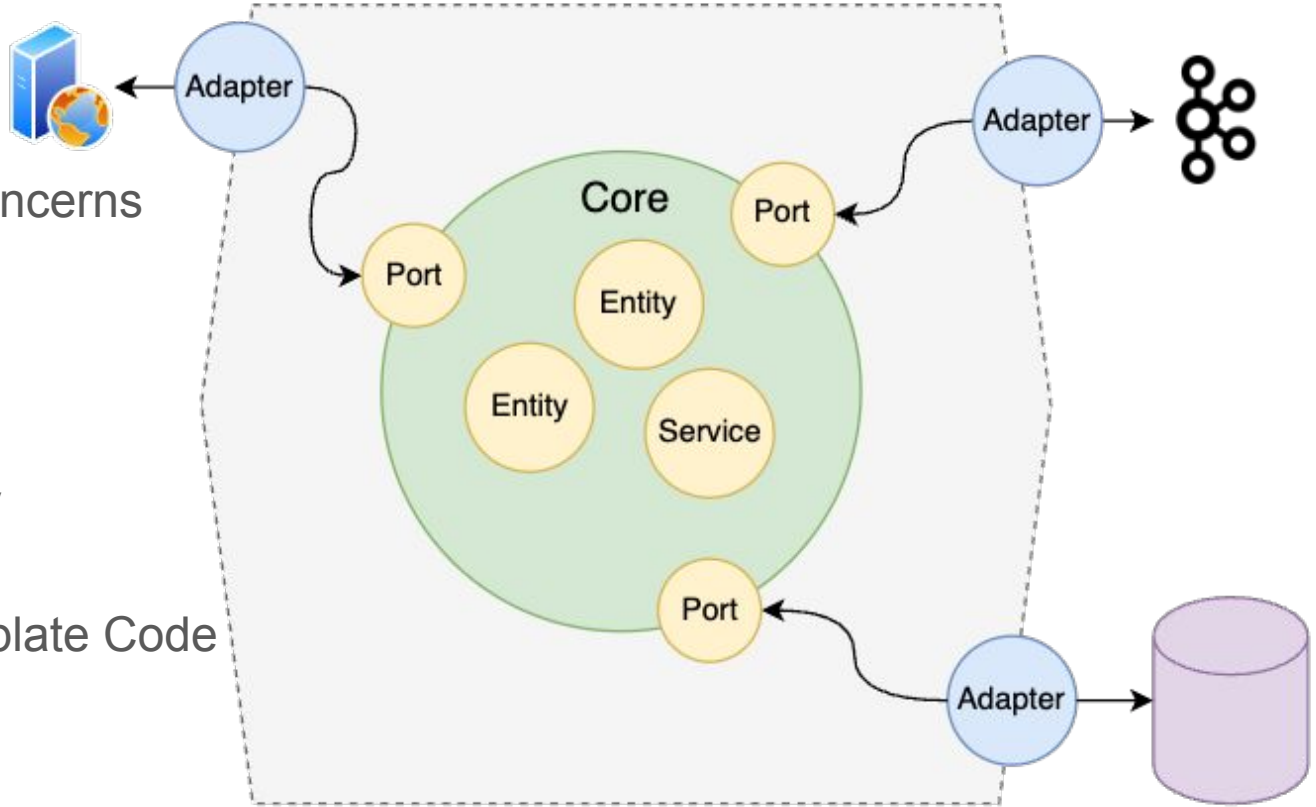
Hexagonal architecture

Pros:

- Testability
- Separation of Concerns
- Flexibility

Cons:

- Initial Complexity
- Learning Curve
- Increased Boilerplate Code



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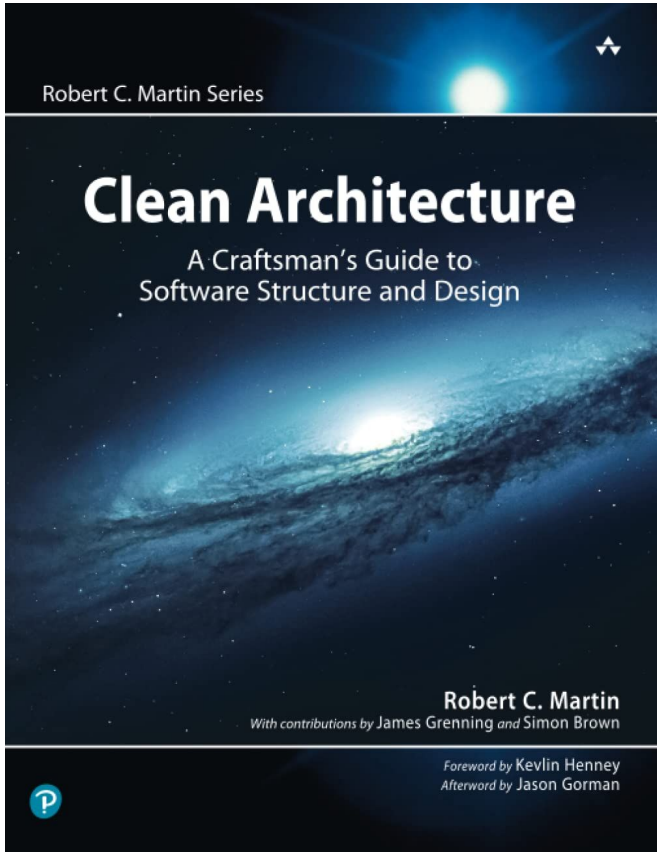
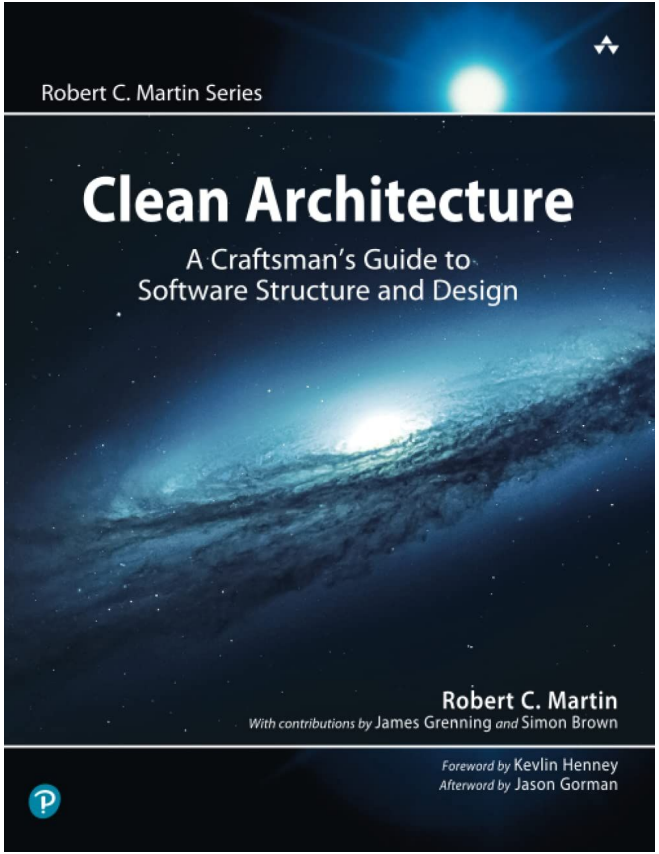
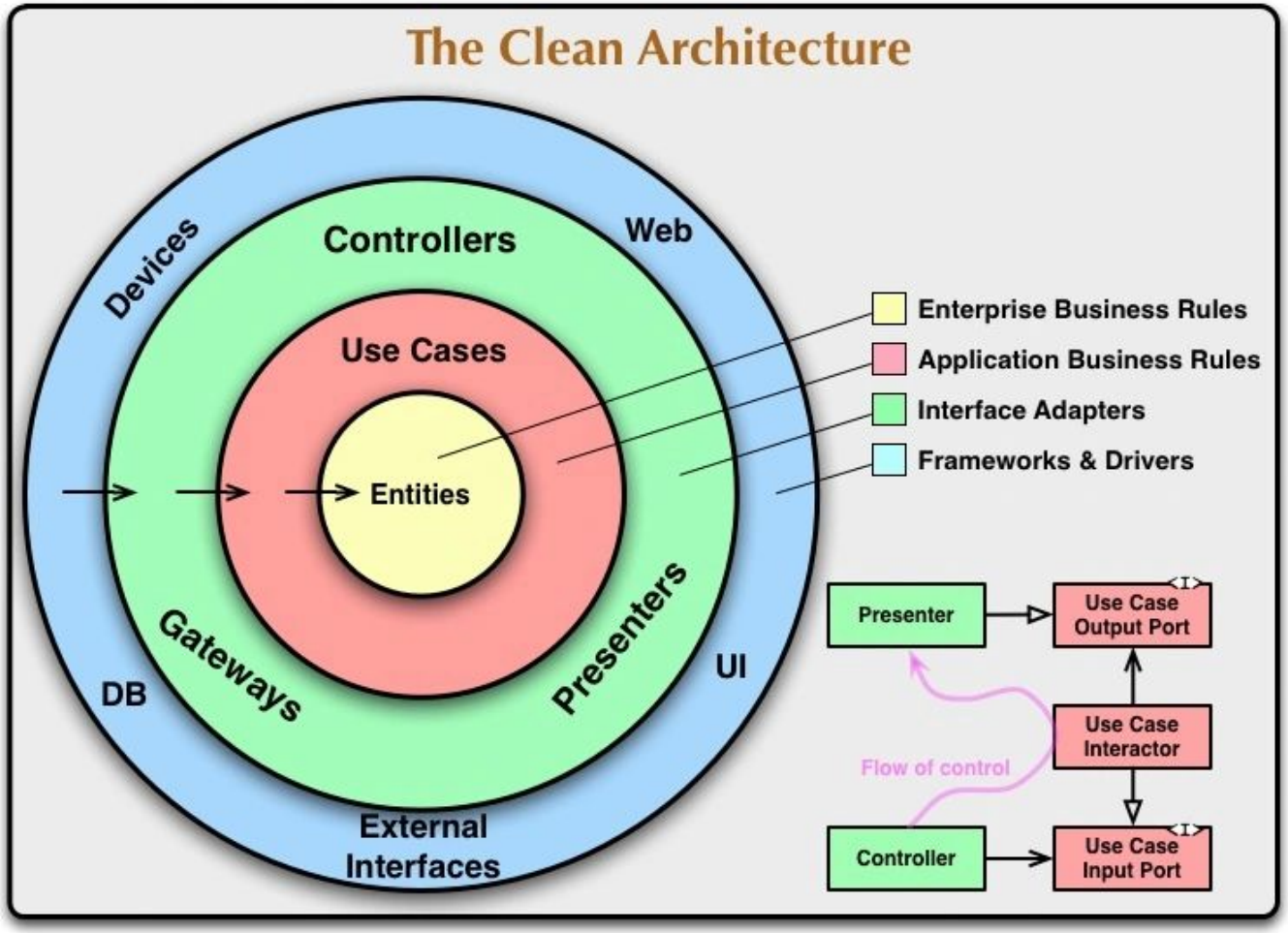


What is “Clean architecture” then?

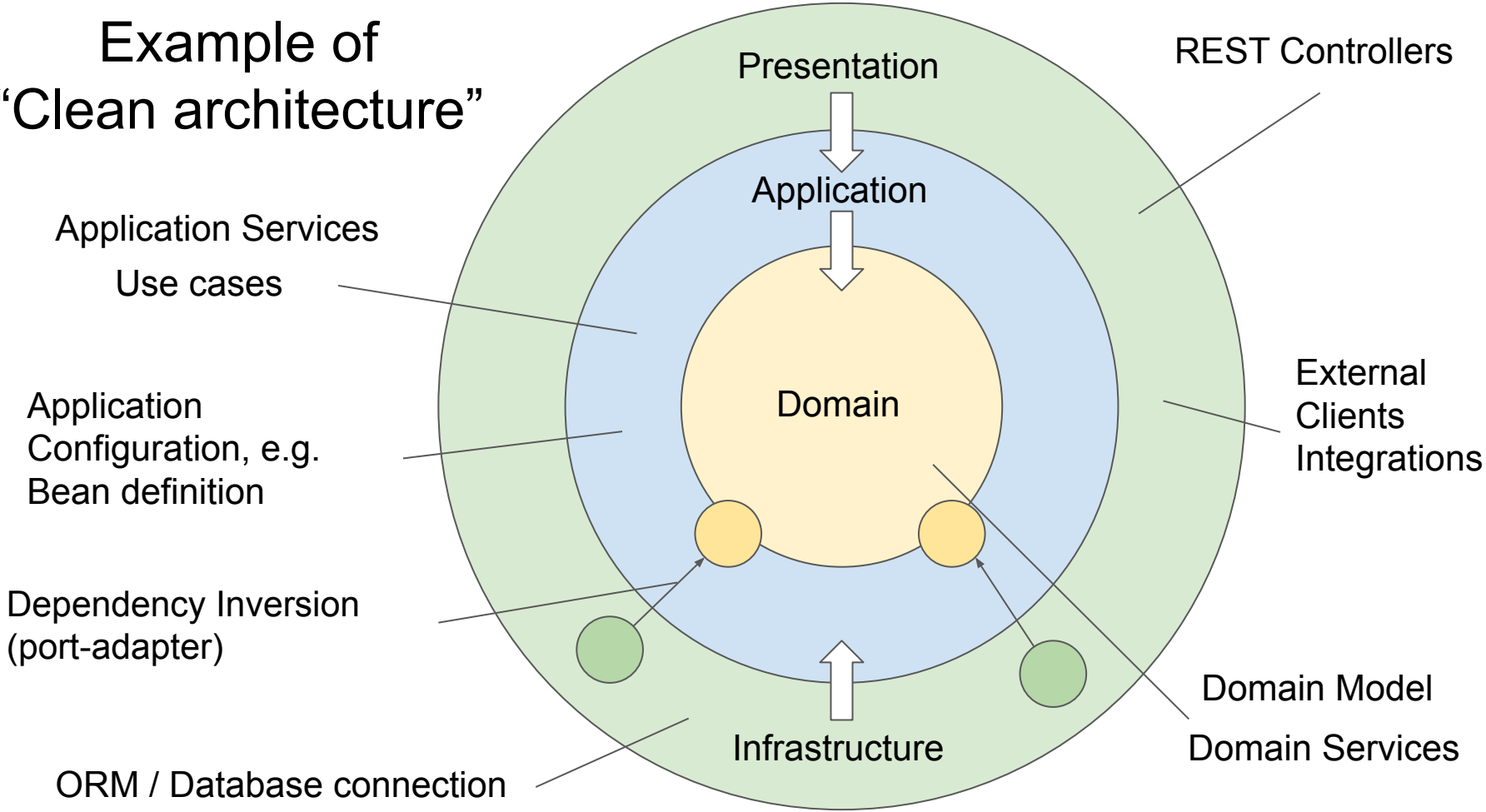
- Highly testable,
- Independent of framework,
- Independent of GUI,
- Independent of database,
- Independent of external dependencies.





https://herbertograca.com/2017/09/28/clean-architecture-standing-on-the-shoulders-of-giants/

Example of “Clean architecture”



Code example

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Step 1: Product Listings

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POST /products

Add Product

GET /products

Product Listings

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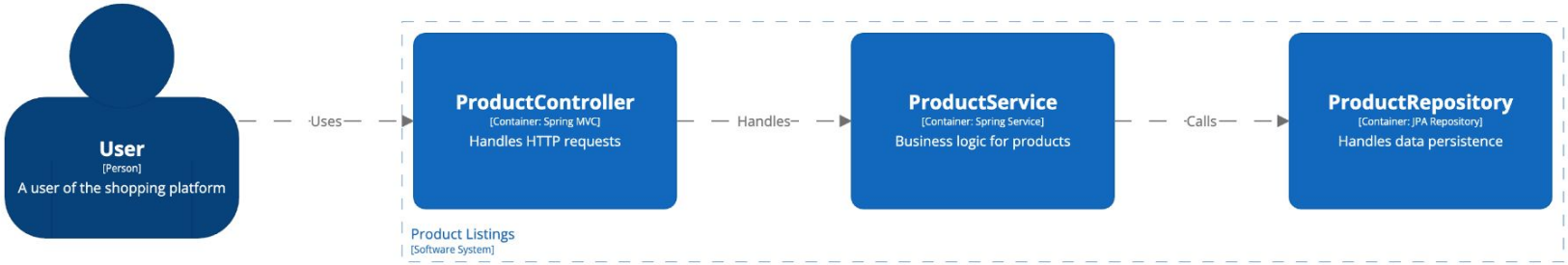

[Container] Product Listings
Thursday 19 September 2024 at 18:40 Central European Summer Time

Demo

Step 2: Manage Product Discounts

Two types of discounts:

- “N for the price of 1”
- Count-based percentage

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- “N for the price of 1”
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POST /products/{productId}/discounts

Add Discount To Product

POST /products/calculate-price

Products Pricing

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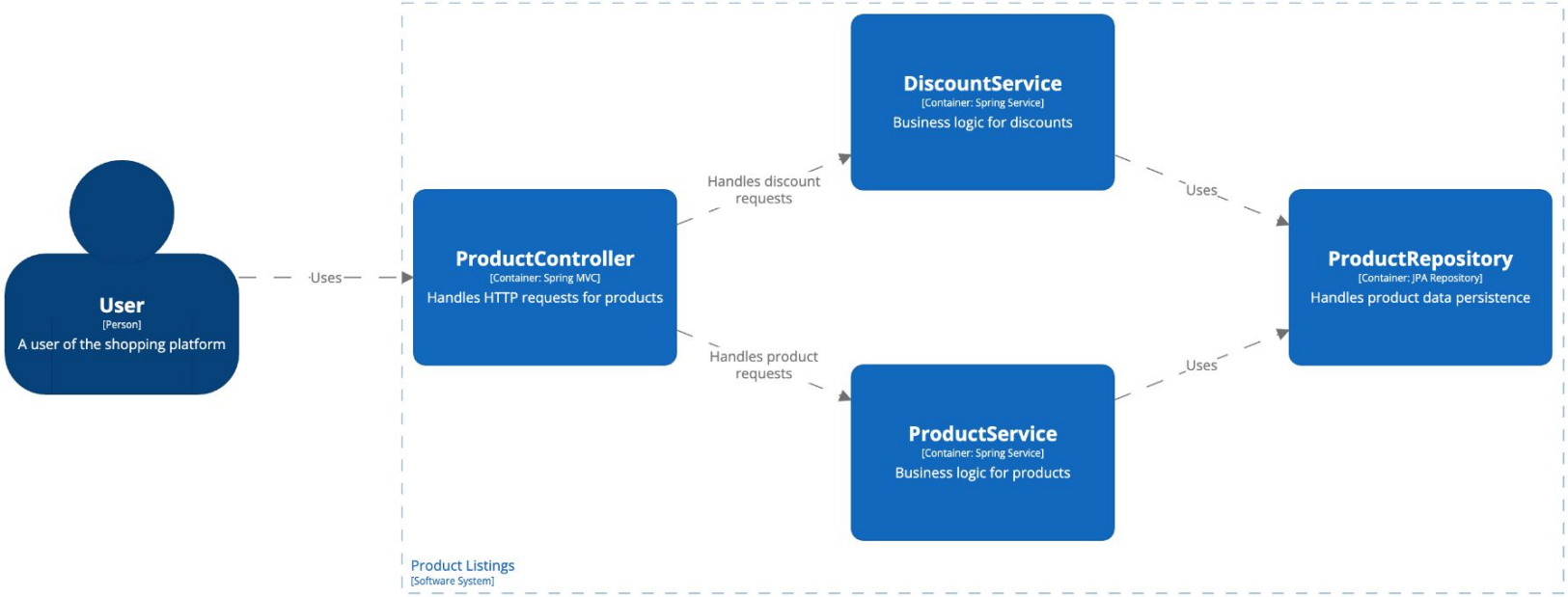

[Container] Product Listings
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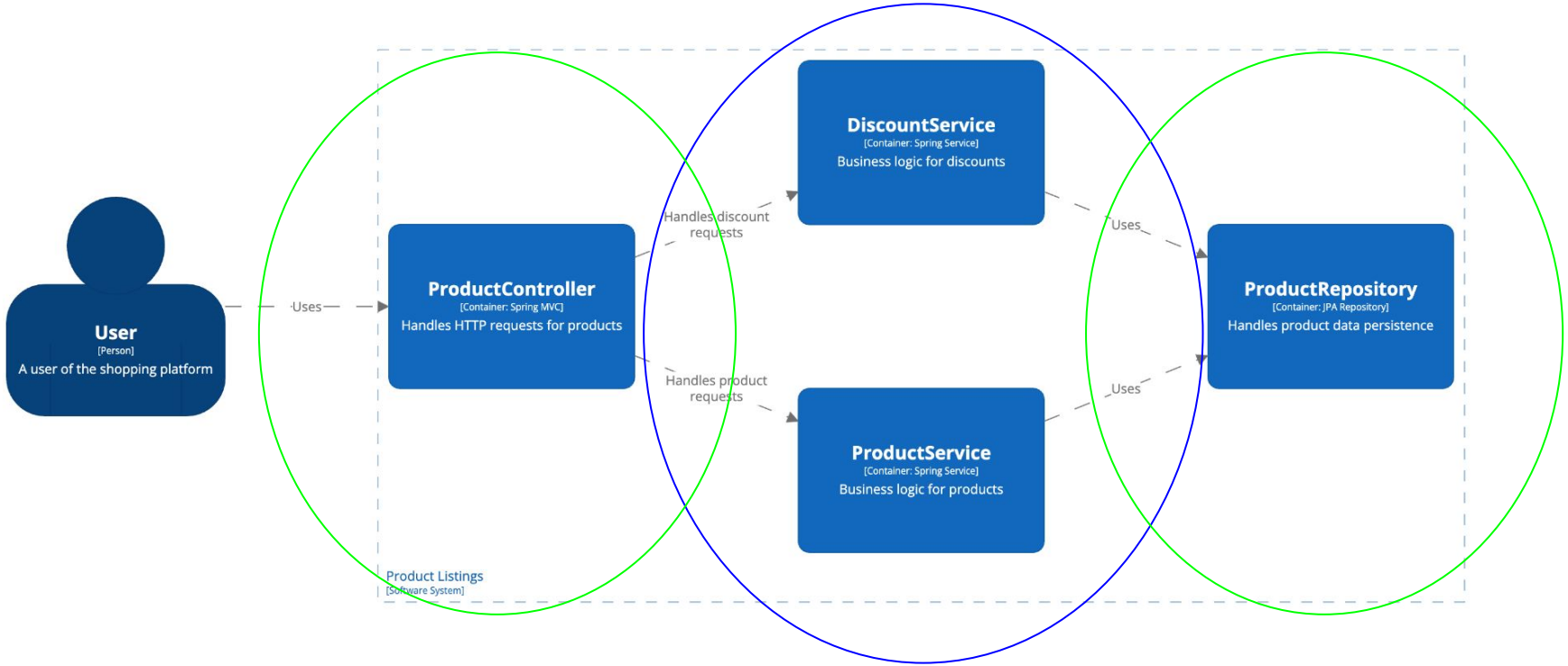
Step 2: Manage Product Discounts



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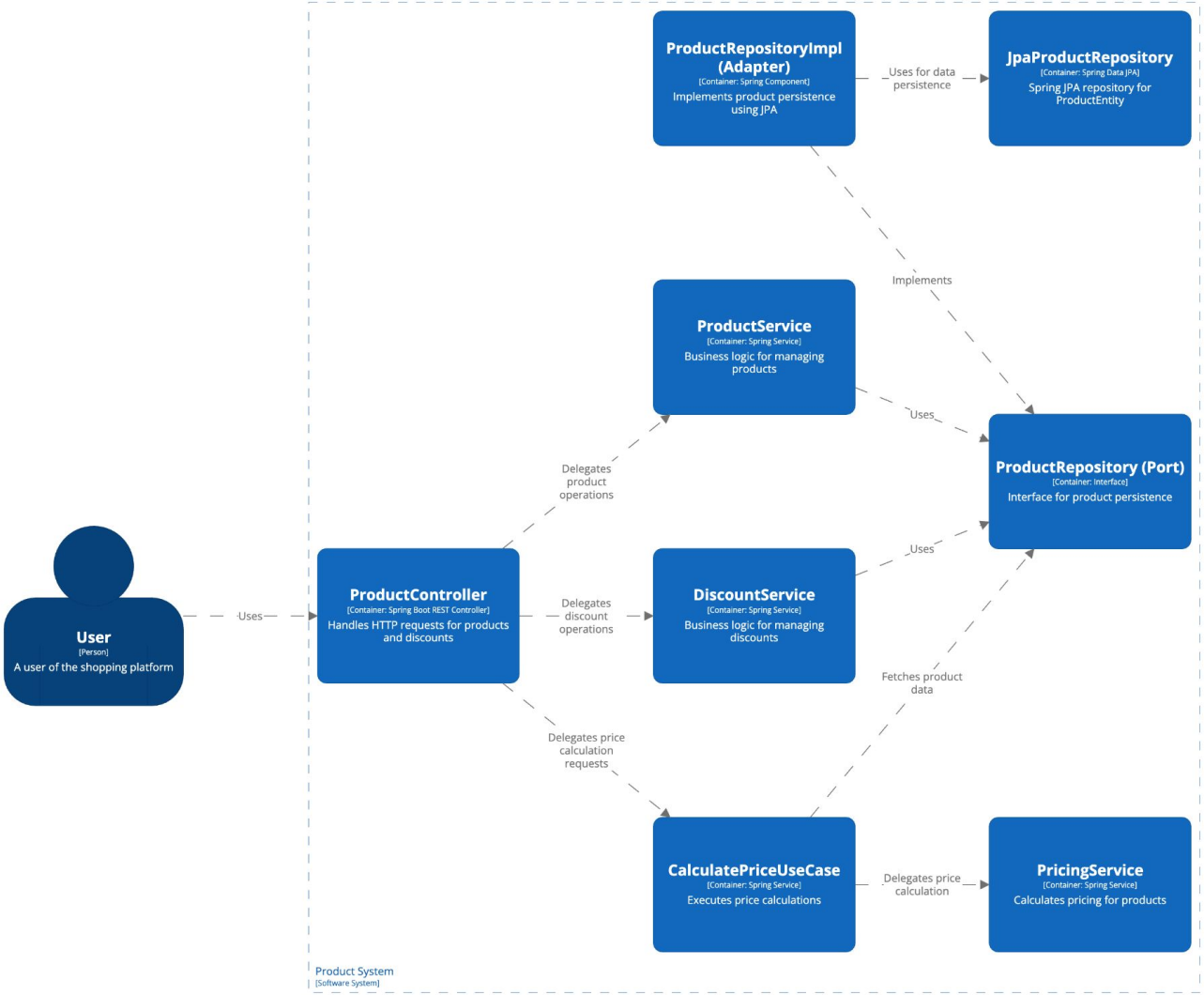
Presentation layer

Business layer

Persistence layer

Demo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Implements product persistence using JPA
Uses for data persistence
JpaProductRepository
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Spring JPA repository for ProductEntity
Implements
ProductService
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Business logic for managing products
Uses
ProductRepository (Port)
[Container: Interface]
Interface for product persistence
Delegates product operations
Uses
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[Person]
A user of the shopping platform
Uses
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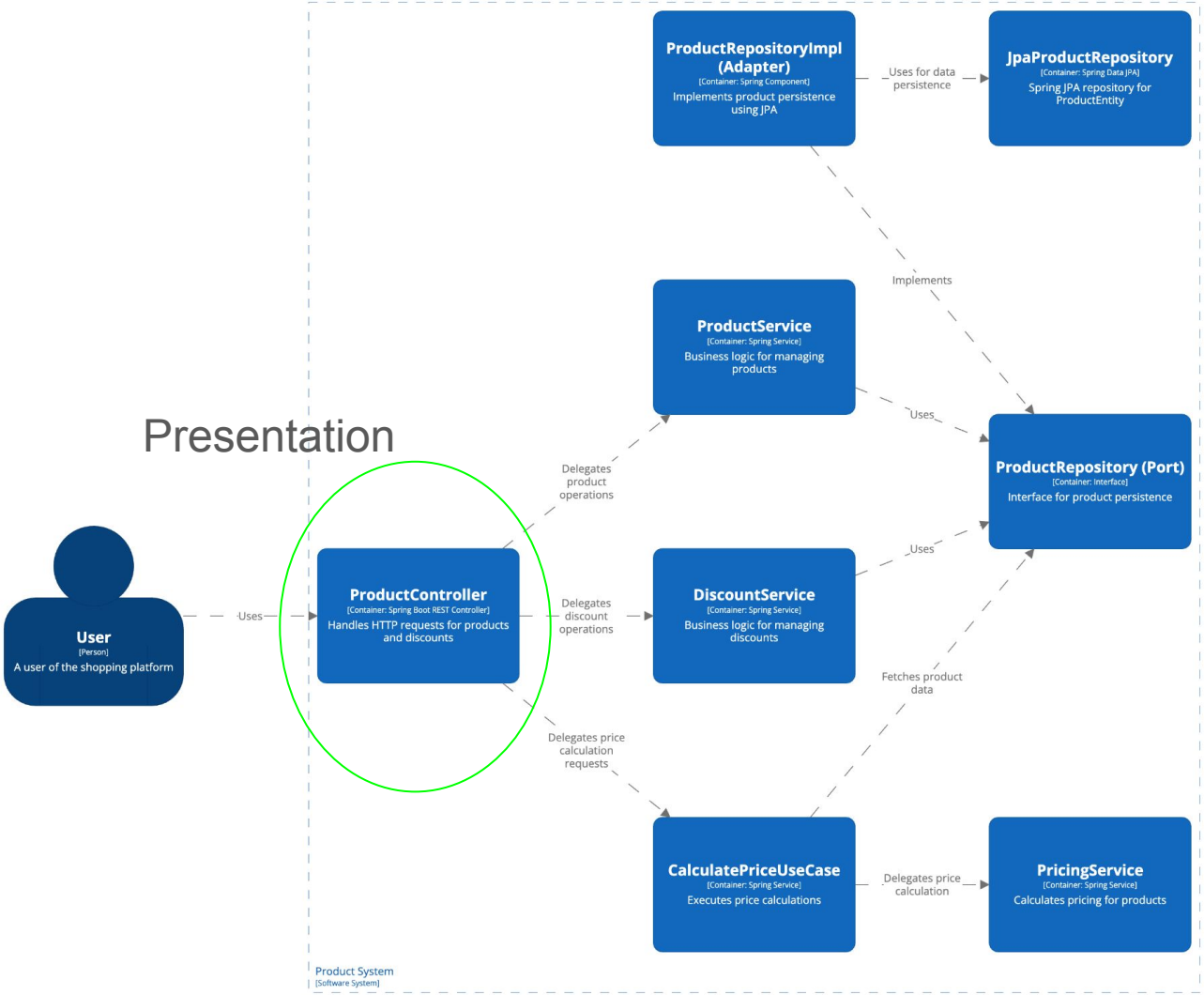
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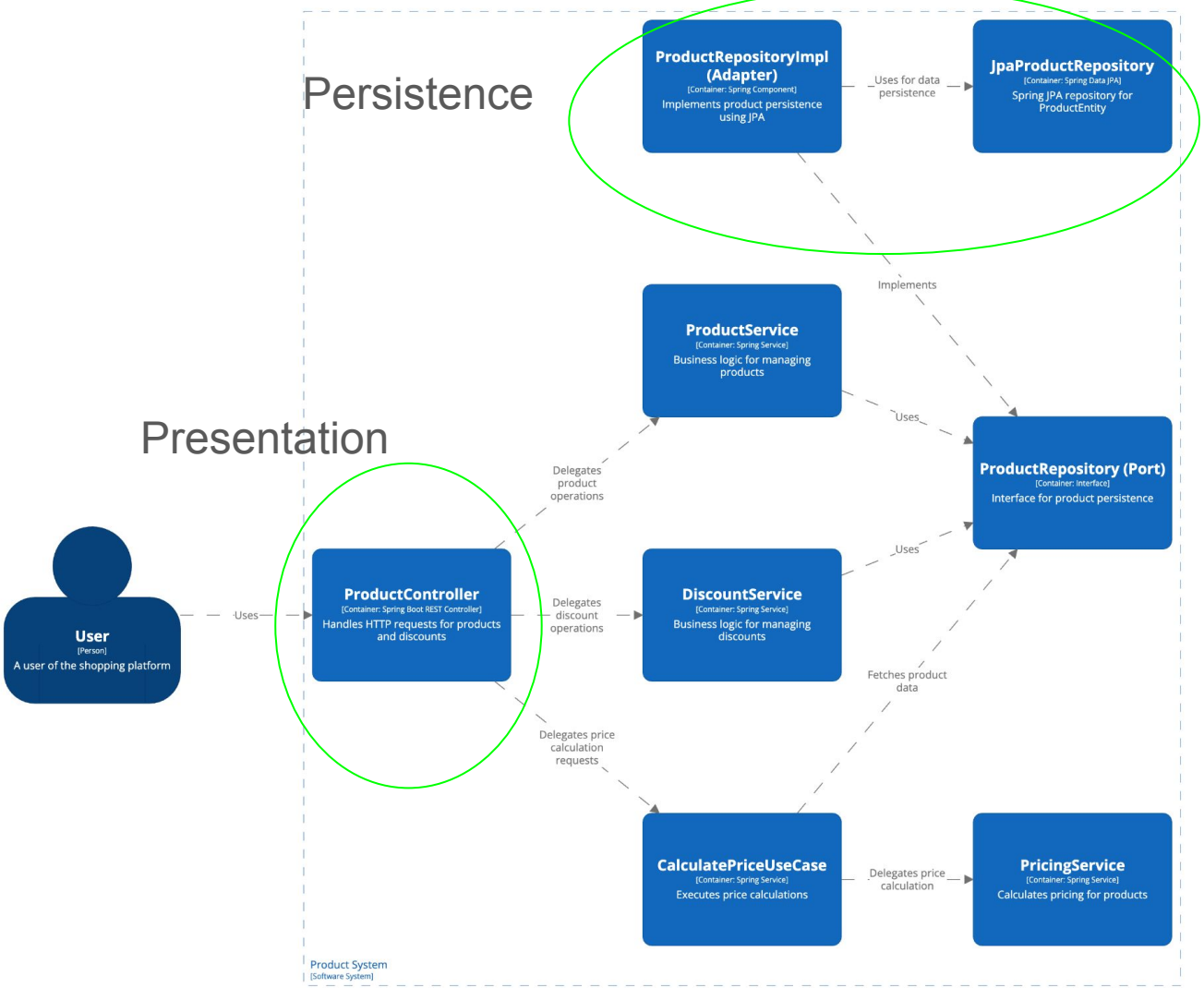
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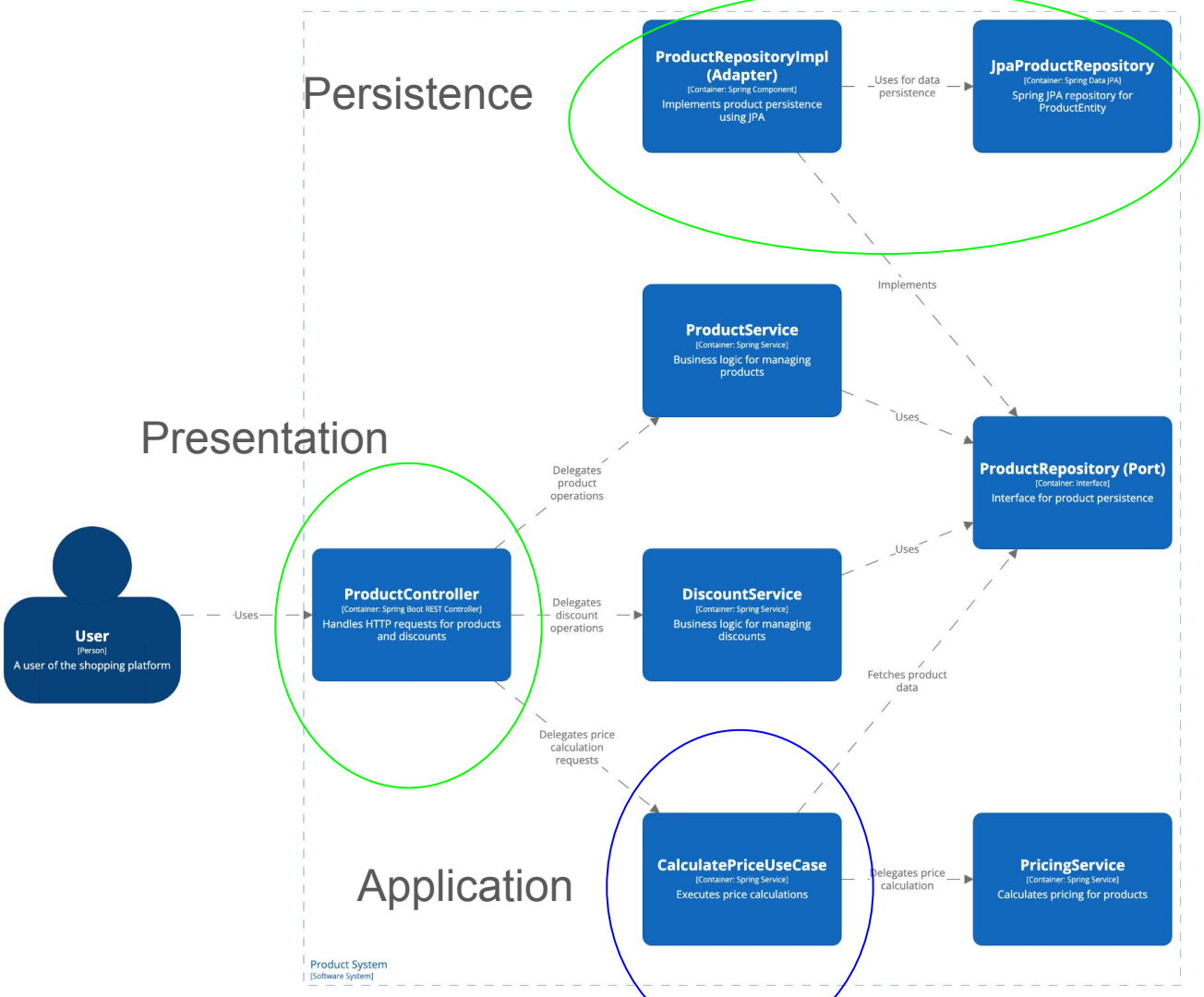
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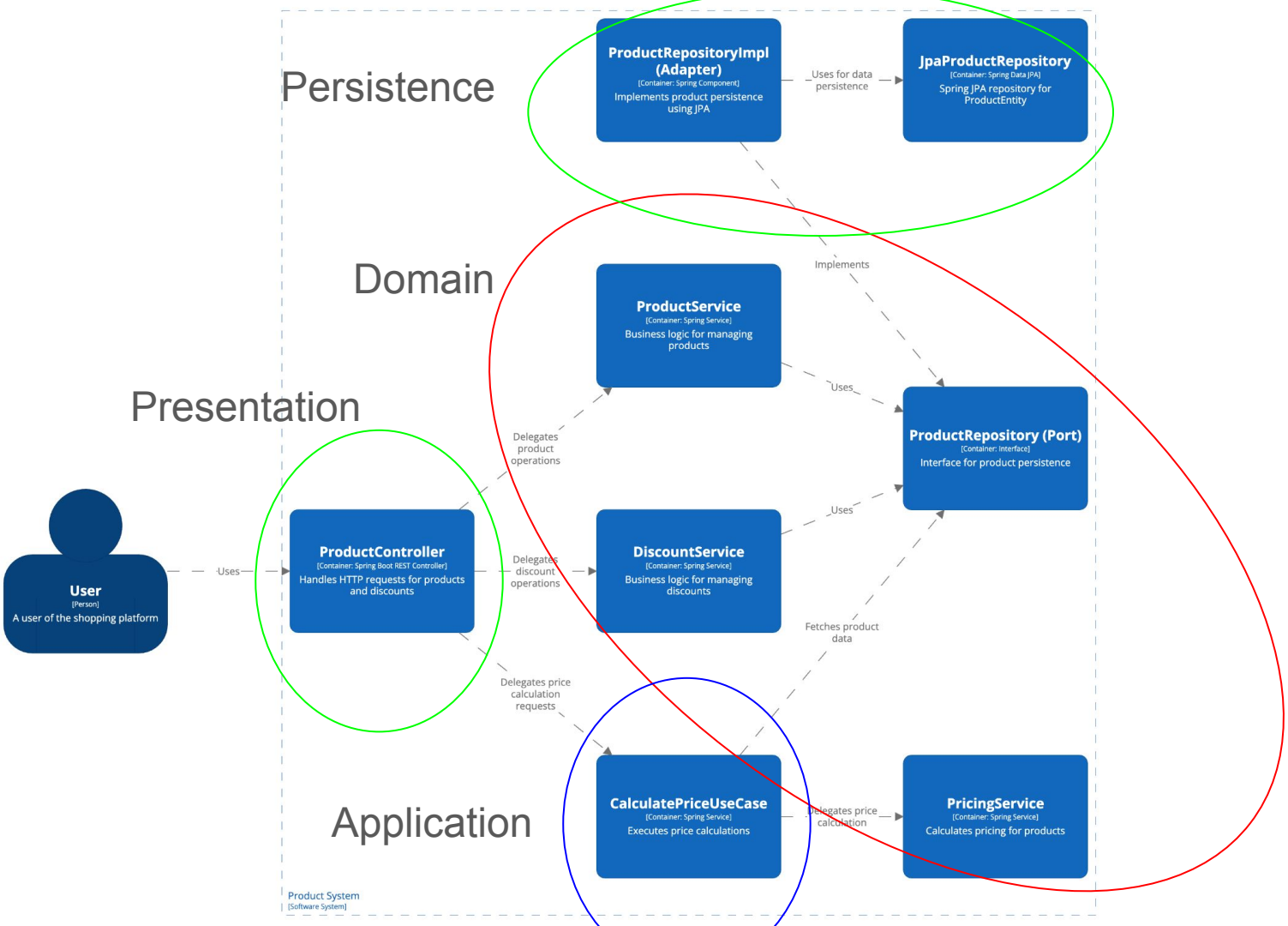
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Symptoms of “unclean” architecture

- Tight coupling,
- Hard-to-test code,
- Mixed concerns,
- Circular dependencies,
- Difficult to extend,
- Unclear structure - where to put my changes?

Q&A