Domain-Driven Design
A Focus On Software Architecture

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About Me

I have more than 24 years of experience in software development, being involved in various projects covering desktop, client/server, web, cloud, and mobile applications using mainly Microsoft tools & technologies, but also Apple and open-source.

I'm a Certified Scrum Master and a certified APMG Agile Project Manager. Since 2003, I'm holding a Ph.D. degree in Industrial Engineering.

You can find more about me on LinkedIn:
https://www.linkedin.com/in/eduardghergu/

Domain-Driven Design: A Deep Dive

1. A short recap on the gathered knowledge

2. Continuing the work on the sample e-Commerce application

3. Conclusions. Q&A

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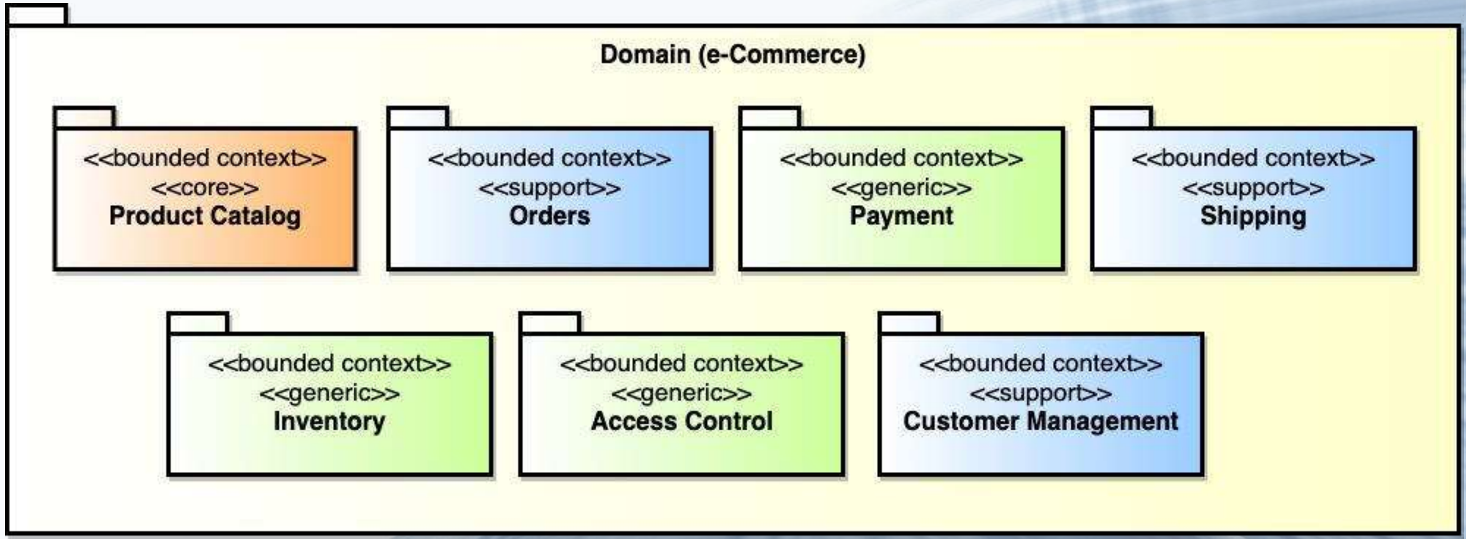
The gathered knowledge

The domain modeled by e-Commerce app:


Domain (e-Commerce)
<<bounded context>> <<core>> Product Catalog
<<bounded context>> <<support>> Orders
<<bounded context>> <<generic>> Payment
<<bounded context>> <<support>> Shipping
<<bounded context>> <<generic>> Inventory
<<bounded context>> <<generic>> Access Control
<<bounded context>> <<support>> Customer Management

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The gathered knowledge - cont.

The identified Bounded Contexts are classified as Core, Support and Generic:

- Usually, there is only one Core, that represents the main part of the Domain - the ***Product Catalog***.
- Support Bounded Contexts are auxiliary ones. They will support the Core, however, they will have their own model.
- Generic Bounded Contexts are similar to support ones, but they have a strong particularity: they are pretty generic so that they could be used not only in the Domain they were created, but they could be used by others Domains, too.

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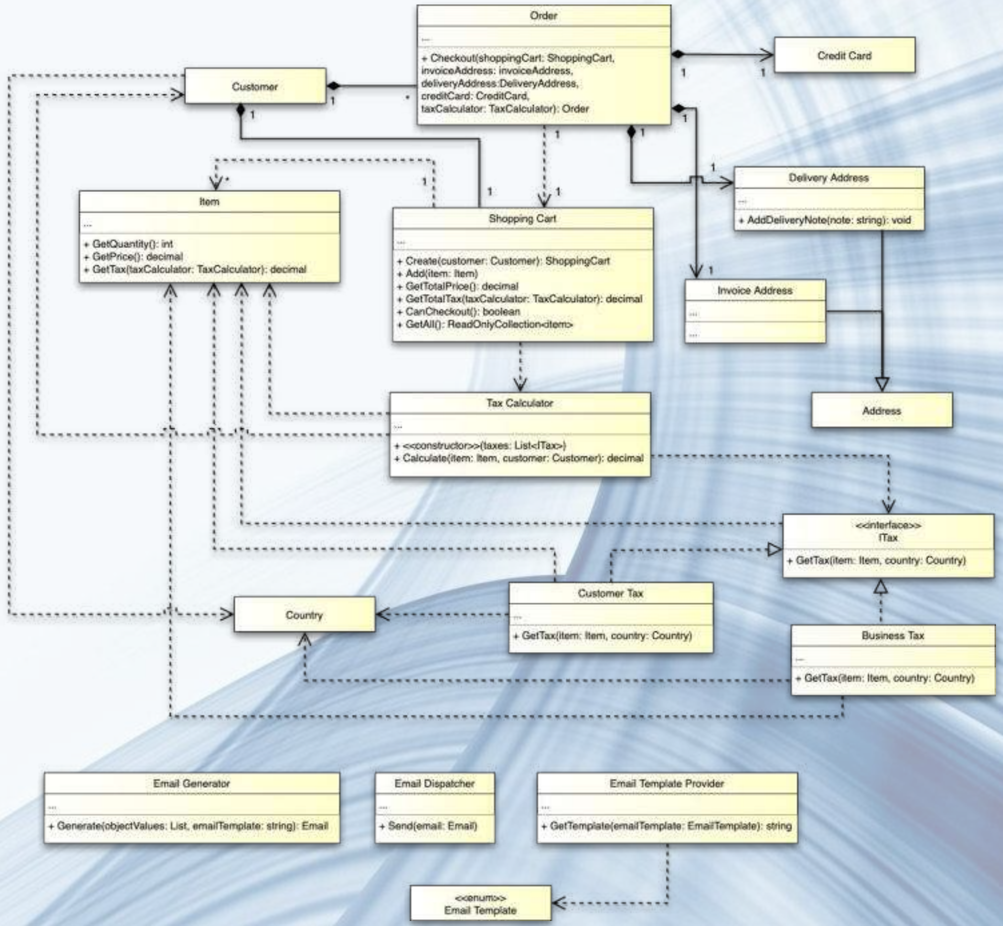
The gathered knowledge - cont.

Class diagram:


Order
...
+ Checkout(shoppingCart: ShoppingCart, invoiceAddress: invoiceAddress, deliveryAddress:DeliveryAddress, creditCard: CreditCard, taxCalculator: TaxCalculator): Order
Credit Card
Customer
Item
...
+ GetQuantity(): int
+ GetPrice(): decimal
+ GetTax(taxCalculator: TaxCalculator): decimal
Shopping Cart
...
+ Create(customer: Customer): ShoppingCart
+ Add(item: Item)
+ GetTotalPrice(): decimal
+ GetTotalTax(taxCalculator: TaxCalculator): decimal
+ CanCheckout(): boolean
+ GetAll(): ReadOnlyCollection<item>
Delivery Address
...
+ AddDeliveryNote(note: string): void
Invoice Address
...
...
Address
Tax Calculator
...
+ <<constructor>>(taxes: List<ITax>)
+ Calculate(item: Item, customer: Customer): decimal
<<interface>>
ITax
+ GetTax(item: Item, country: Country)
Country
Customer Tax
...
+ GetTax(item: Item, country: Country)
Business Tax
...
+ GetTax(item: Item, country: Country)
Email Generator
...
+ Generate(objectValues: List, emailTemplate: string): Email
Email Dispatcher
...
+ Send(email: Email)
Email Template Provider
...
+ GetTemplate(emailTemplate: EmailTemplate): string
<<enum>>
Email Template
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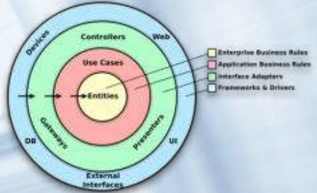
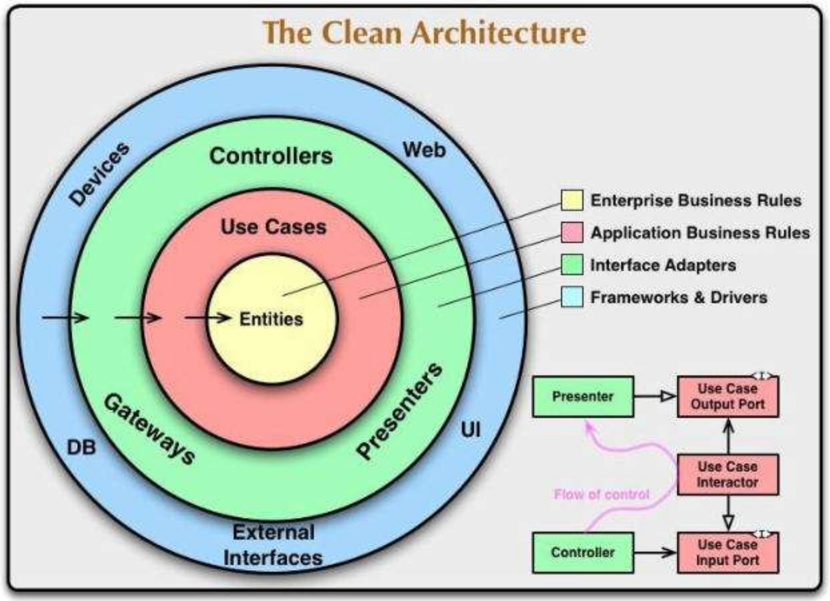
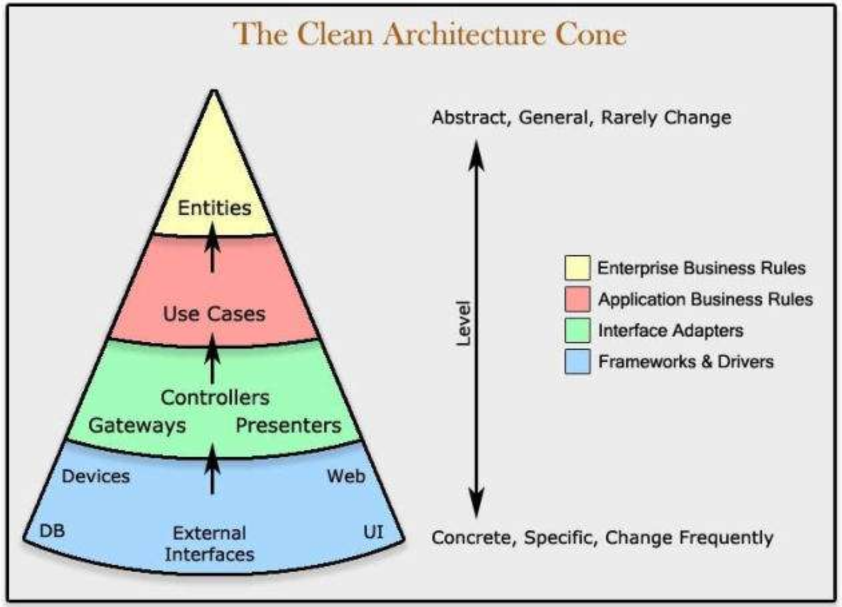
The gathered knowledge - cont.



Clean Architecture Building Blocks[11]





The Clean Architecture Cone
Entities
Use Cases
Controllers
Gateways
Presenters
Devices
Web
DB
External Interfaces
UI
Abstract, General, Rarely Change
Level
Concrete, Specific, Change Frequently
🟨 Enterprise Business Rules
🟥 Application Business Rules
🟩 Interface Adapters
🟦 Frameworks & Drivers

Original view [11] **Alternative view [12]**

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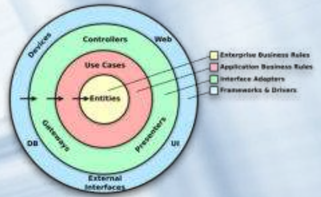
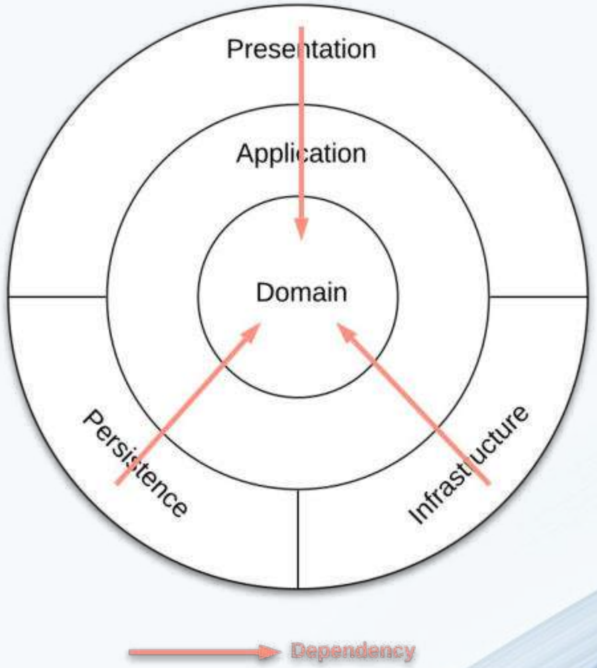
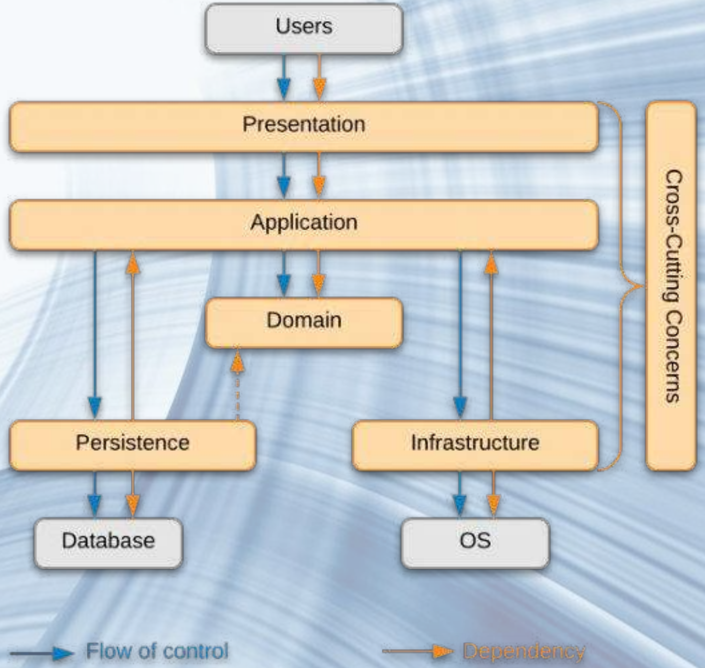
The gathered knowledge - cont.



Clean Architecture - Down to Earth





Developer view [11]

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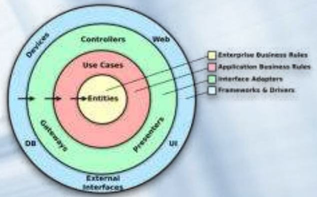
The gathered knowledge - cont.



Command-Query Separation (CQS)

- Software Design Pattern

Command:

- Does something (execute a request)
- Should modify state
- Should not return a value (ideally; better, rise an event)

Query:

- Answers a question (respond to a request)
- Should not modify state
- Always returns a value

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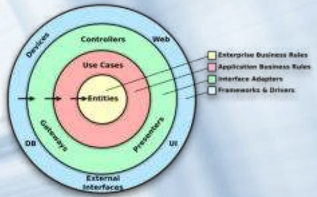
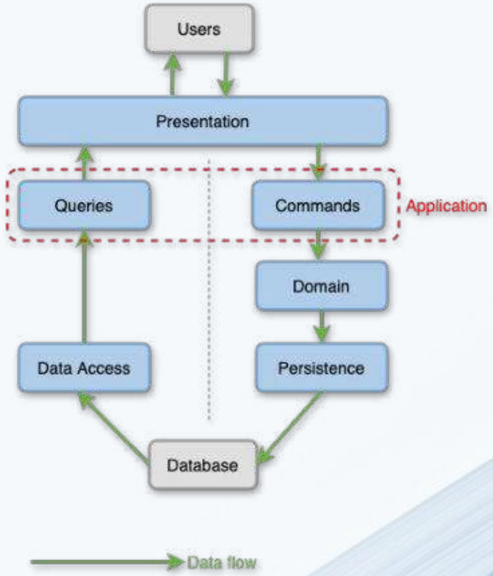
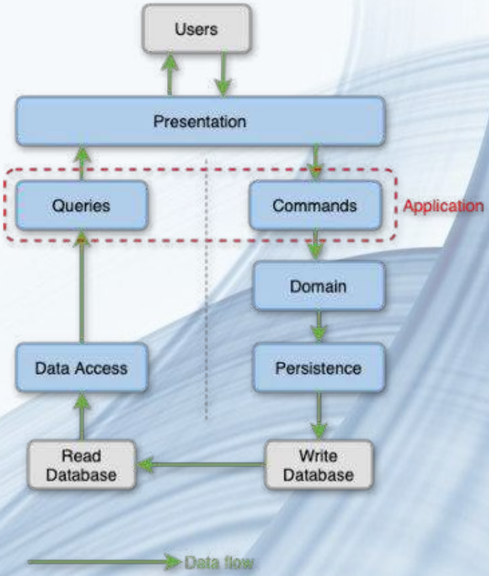
The gathered knowledge - cont.

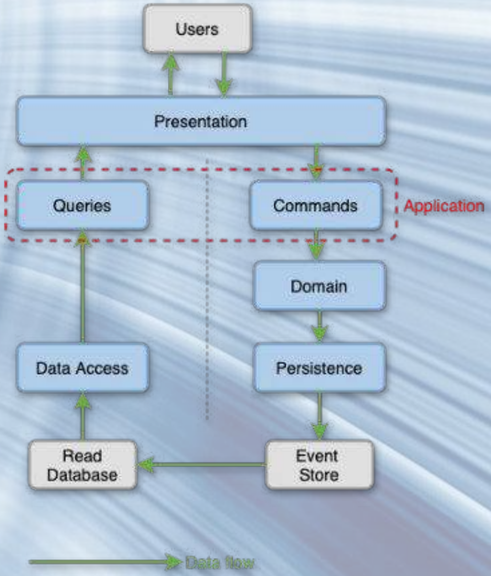


Command-Query Responsibility Segregation (CQRS)

- **Architecture Design Pattern**







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Sample app - Code (draft)

https://github.com/AbstractSoft/eCommerce

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Q & A

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Thank you!

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