



Rethink your architecture with CQRS

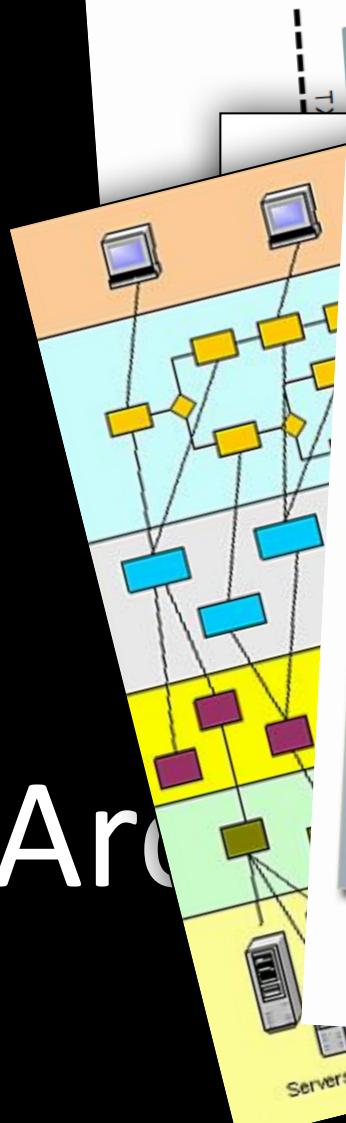
Pieter Joost van de Sande
Passionated software developer, Atos

Email: pj@born2code.net
@twitter: pjvds



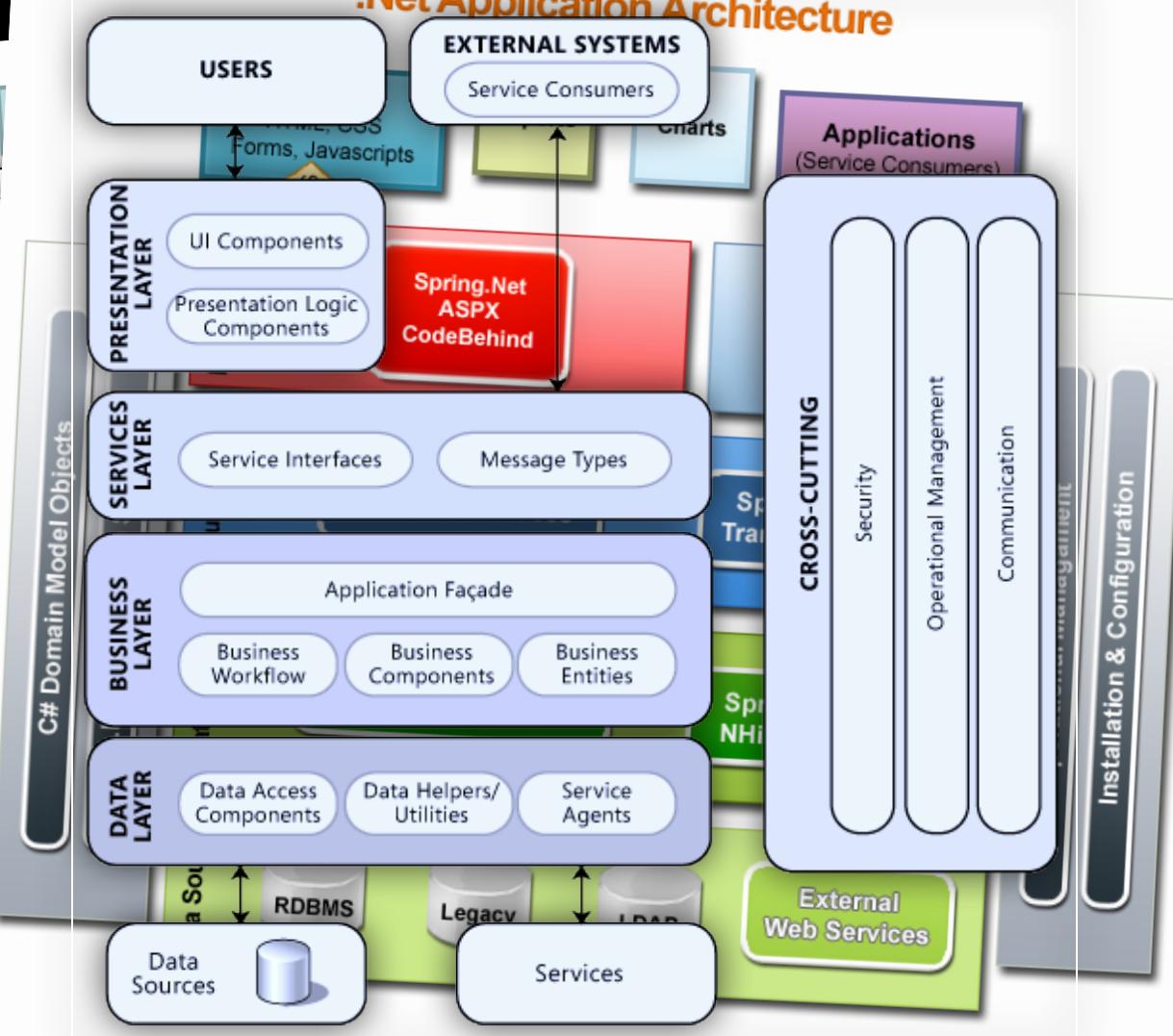
This is meant to be a take away!

dev
ten
Noord



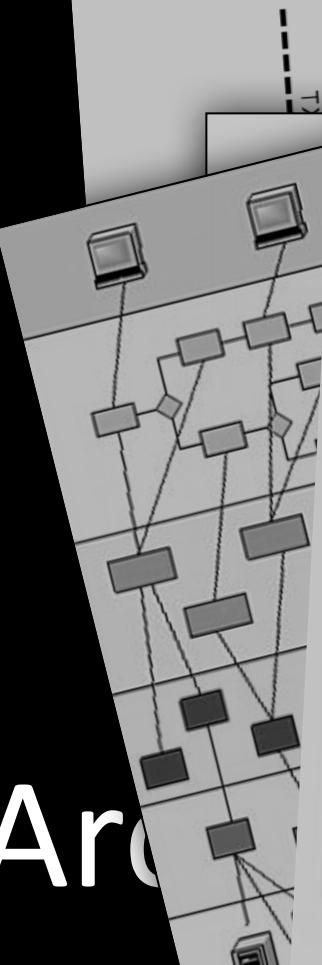
Presentation tier
The presentation tier

.Net Application Architecture



Installation & Configuration

Architectuur



Presentation tier
The presentation tier

.Net Application Architecture

Presentation

Domain

Data

Why do we love it?



Data



Present...
The



Insta

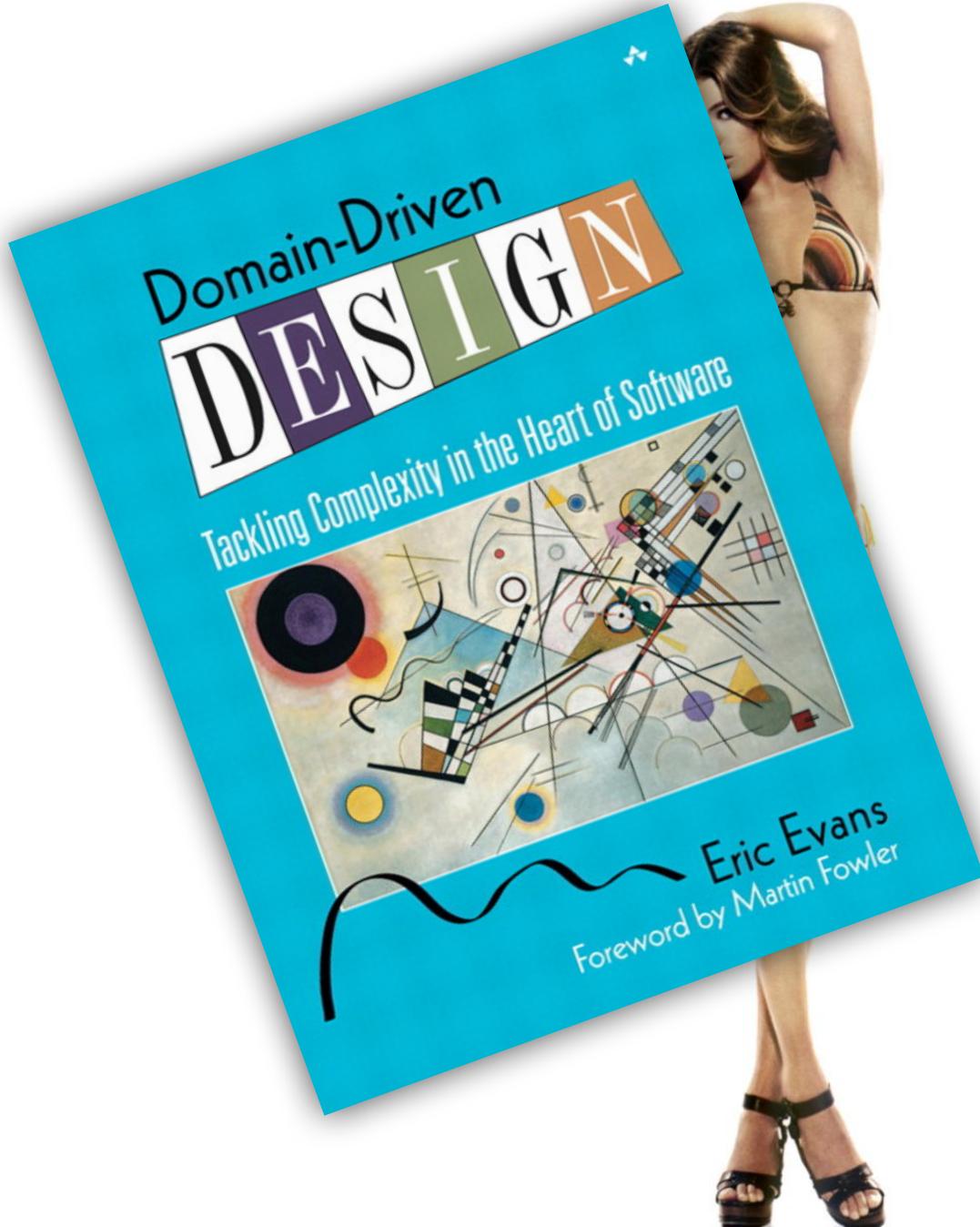
ALL SALES
FATHER

ess
ties

gents

rvices

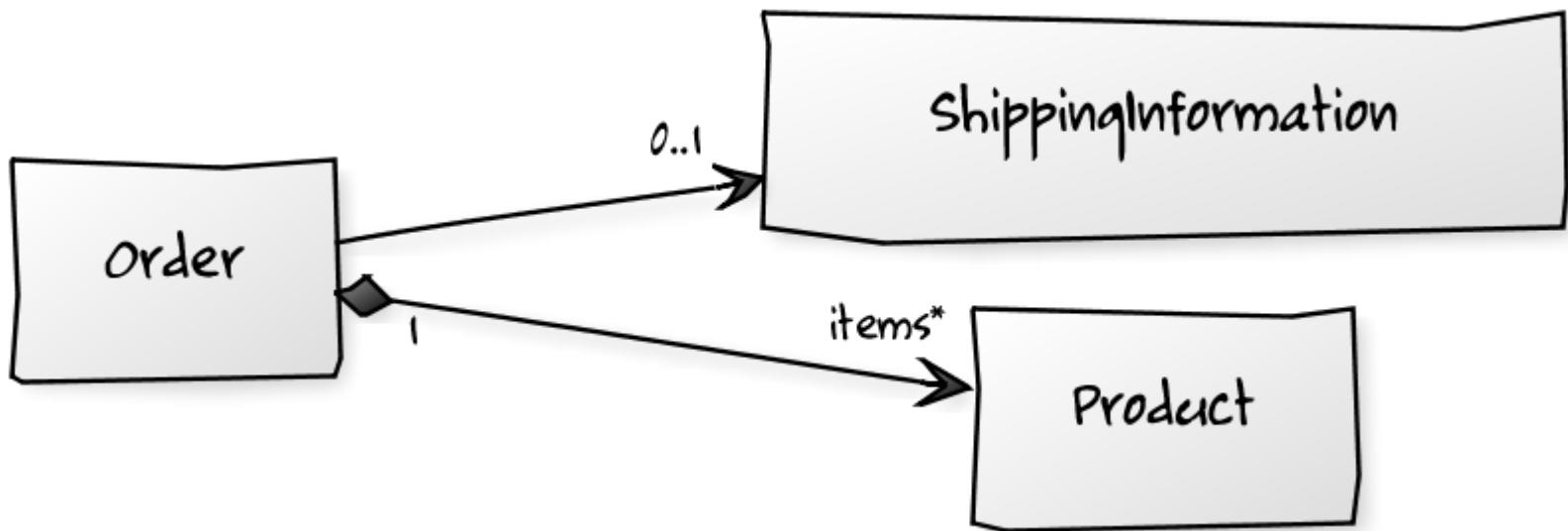
model



Domain Driven Design
Eric Evans - 2003



The value of a structured Model





Who believes in this?

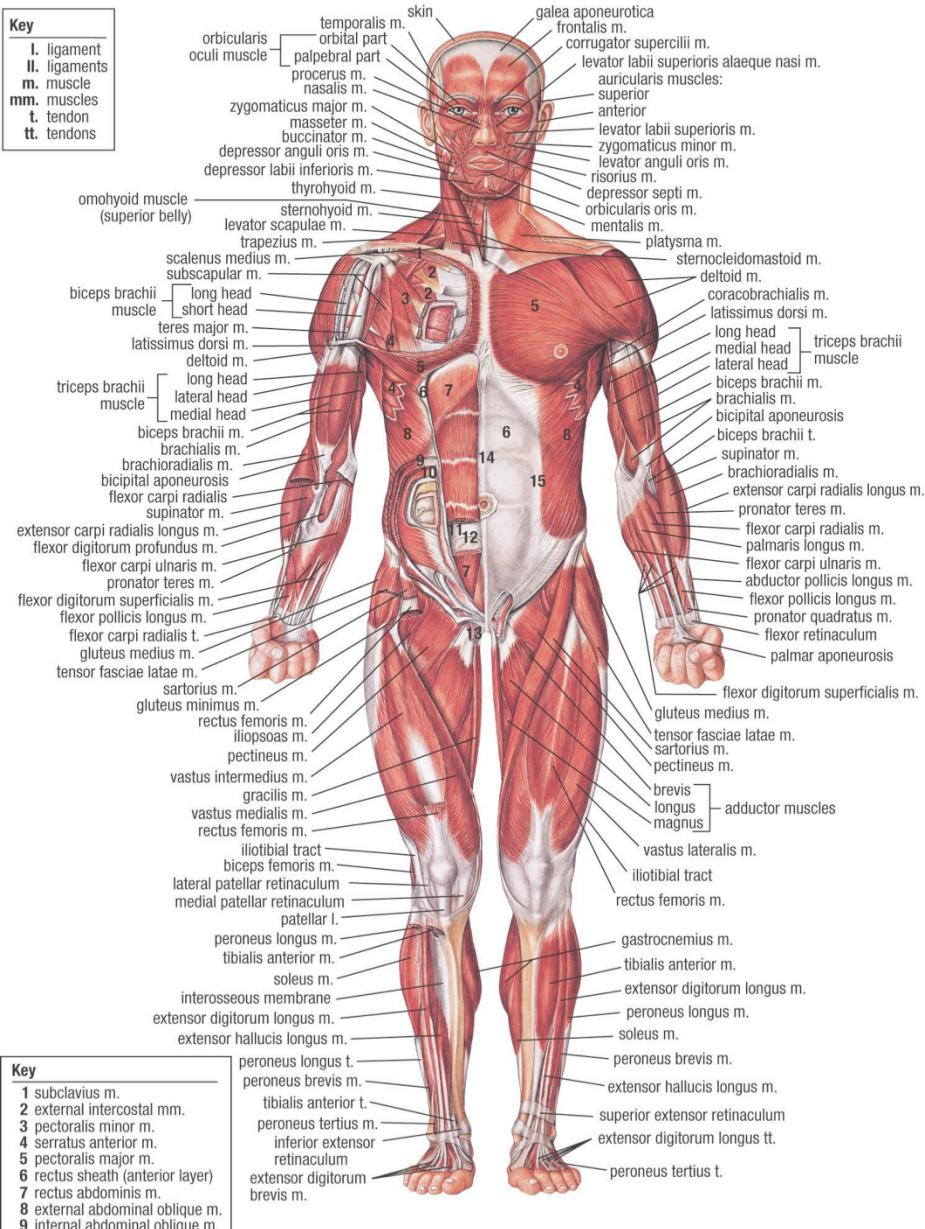


QUICK 'N BRITE
BIODEGRADABLE/CONCENTRATED
CLEANER
"THE TRUE ALL PURPOSE CLEANER"

SPECIAL
DISCOUNT
**ORDER
NOW**



Structured models are always
created from a single viewpoint!



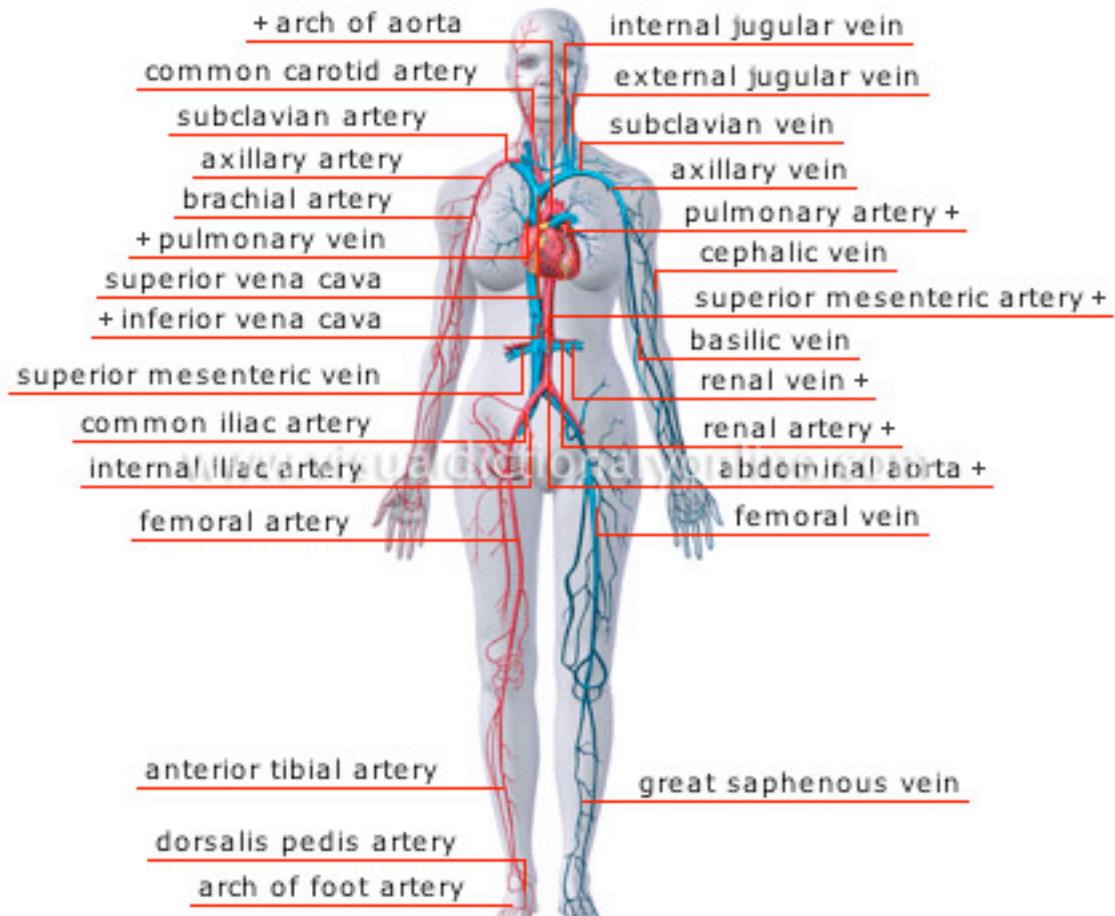
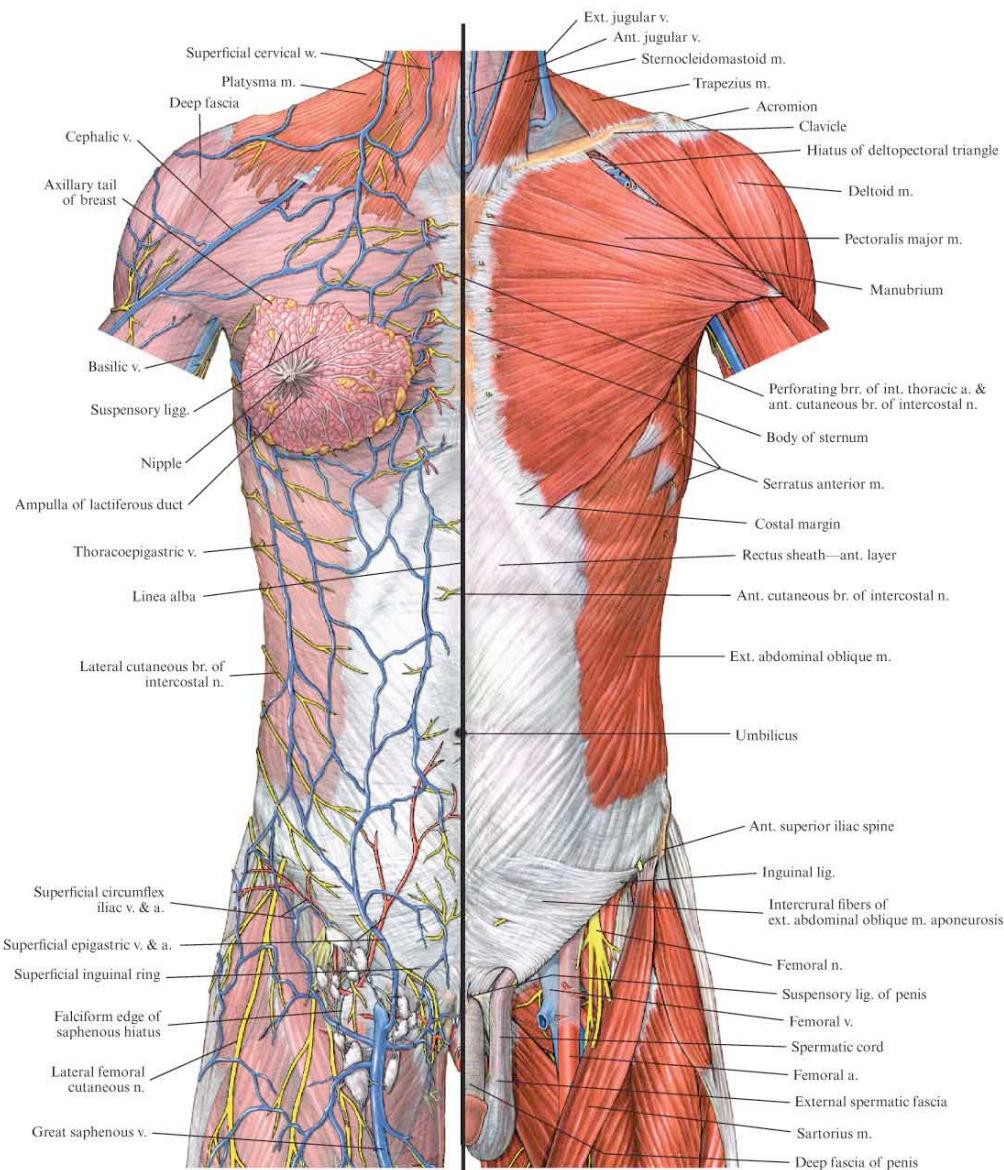


PLATE 1.37 ANTERIOR BODY WALL—SUPERFICIAL



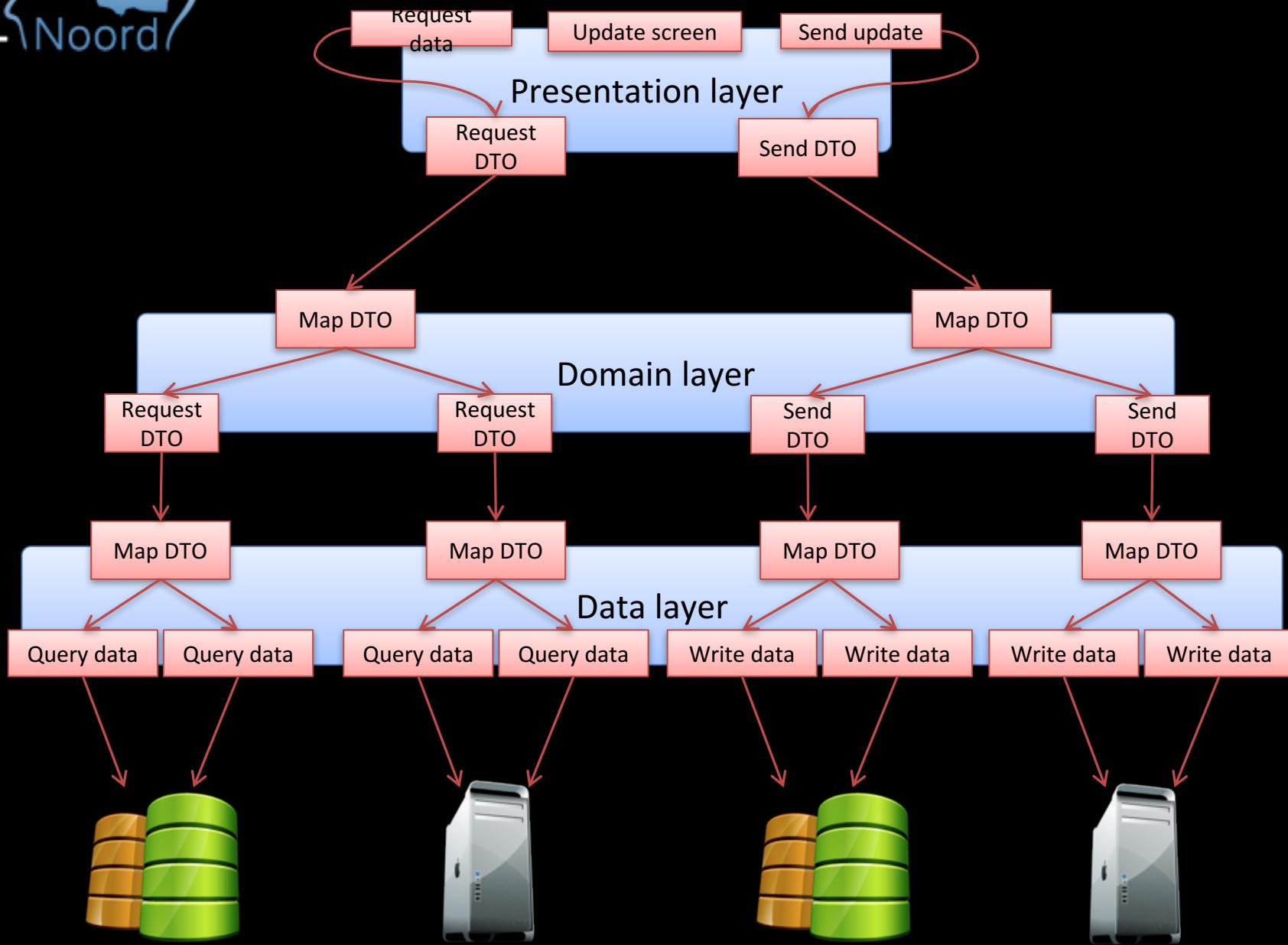
Anterior View







**A model can only be optimized for
one thing... and one thing only!**



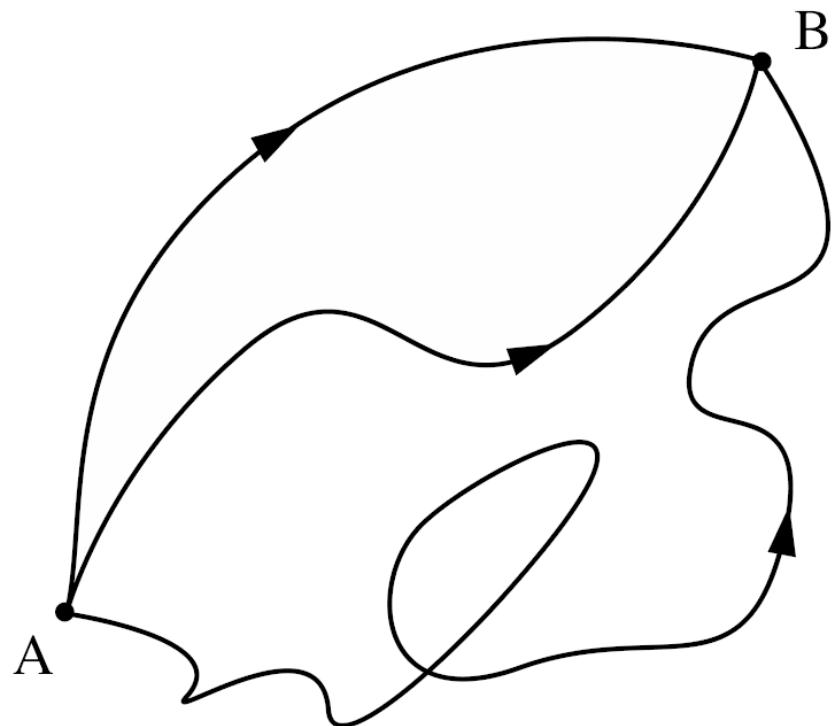


TWO FUNDAMENTALS

Information



Transitions



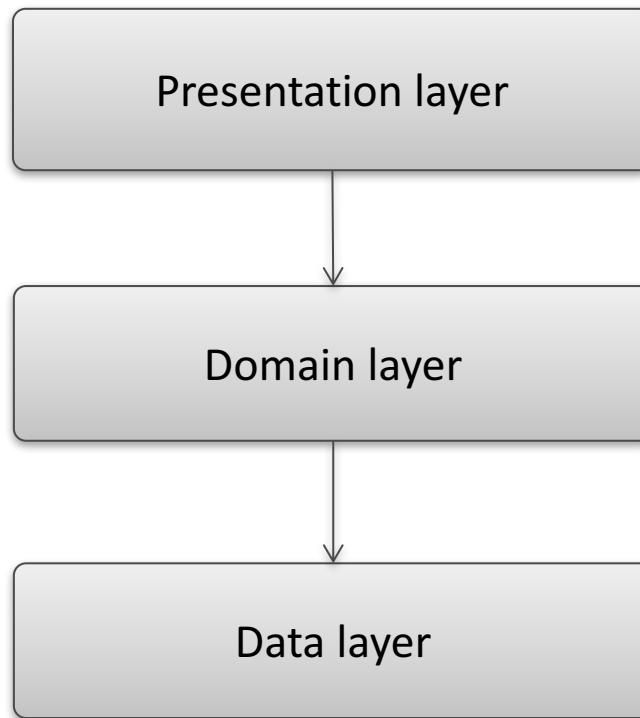


WRITING != READING



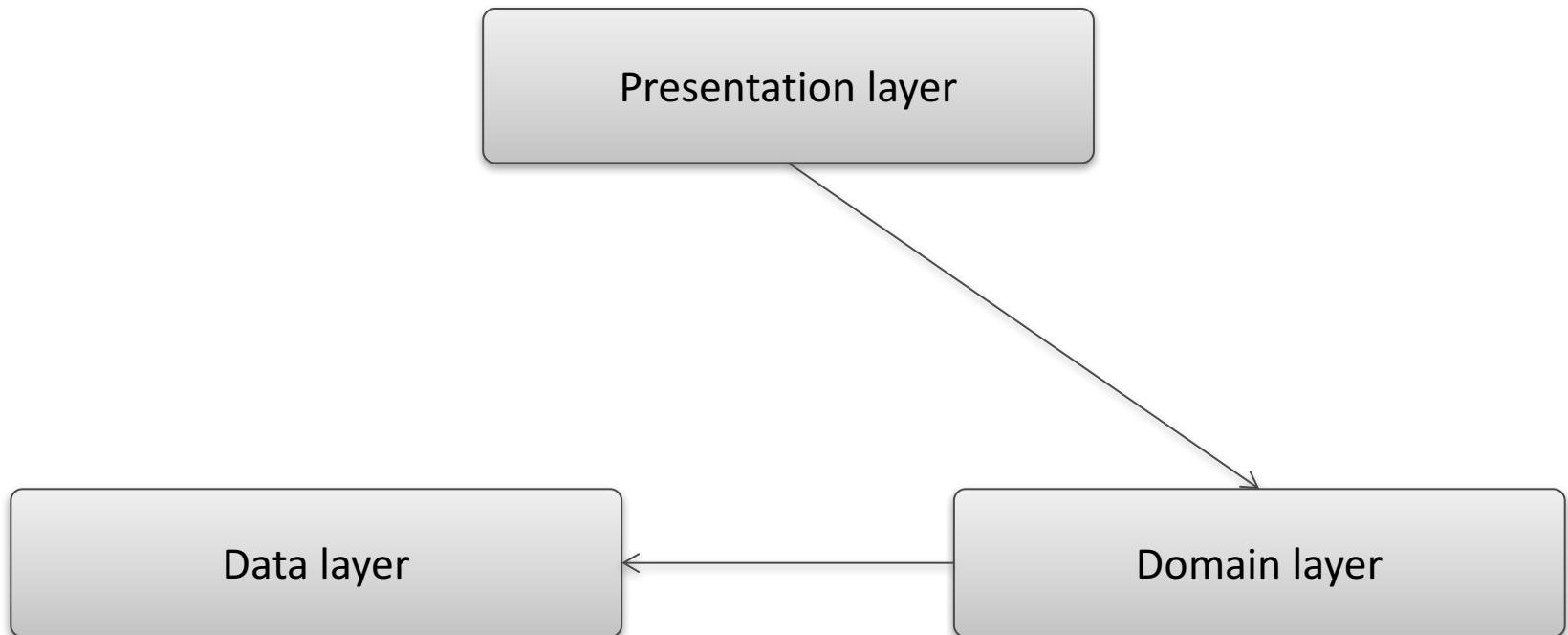


From 3-tier to CQRS



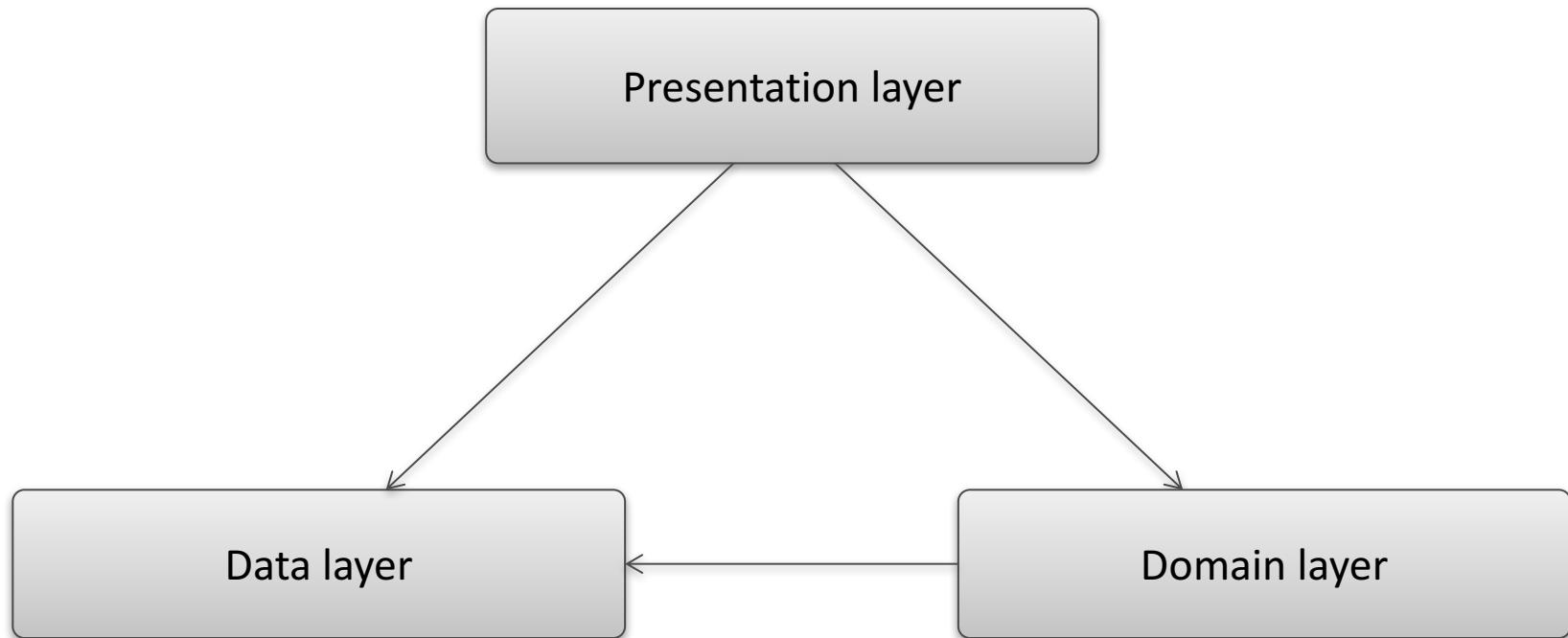


Just re-order the tiers



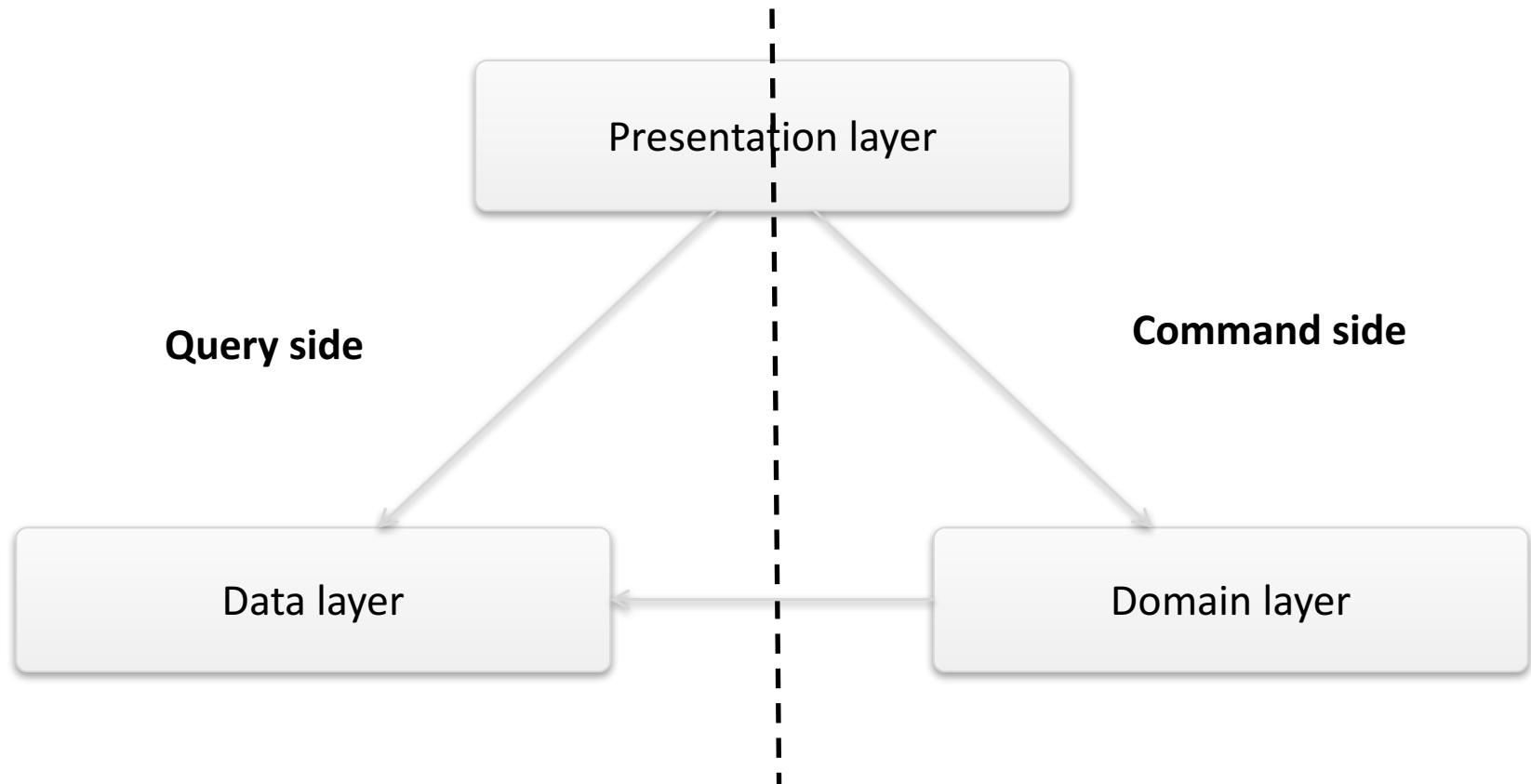


Switch dependency





CQRS!





FROM CONCEPT TO ARCHITECTURE

User interface



Demand for information

Read side





We read a lot





We have multiple screens to fill

CustomerList
CustomerId
Fullname
City
County

TopOrderPerCustomer
CustomerId
OrderId
OrderDate
TotalPrice

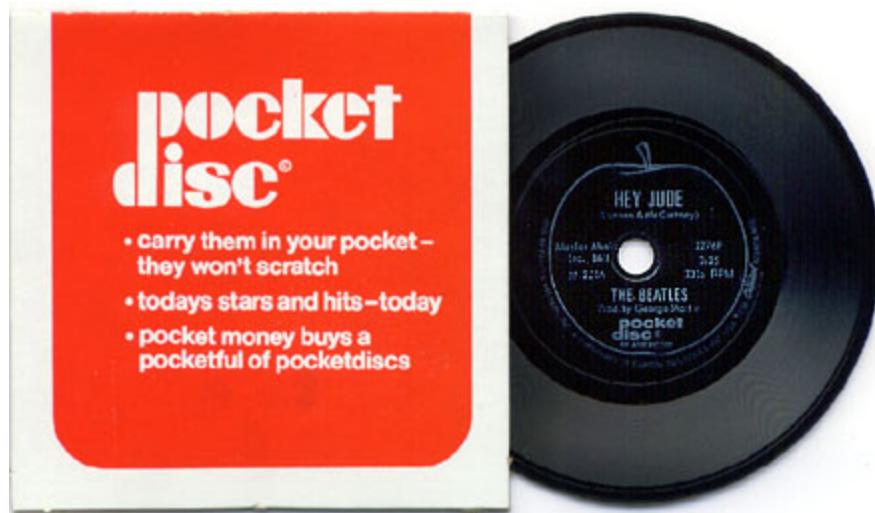
CustomerDetailView
CustomerId
Firstname
Surname
Street
PostalCode
City
County
TelephoneNumber
EmailAddress

CustomerNamesView
CustomerId
Fullname

TotalOrderCountPerCounty
County
OrderCount



Data should be close to us

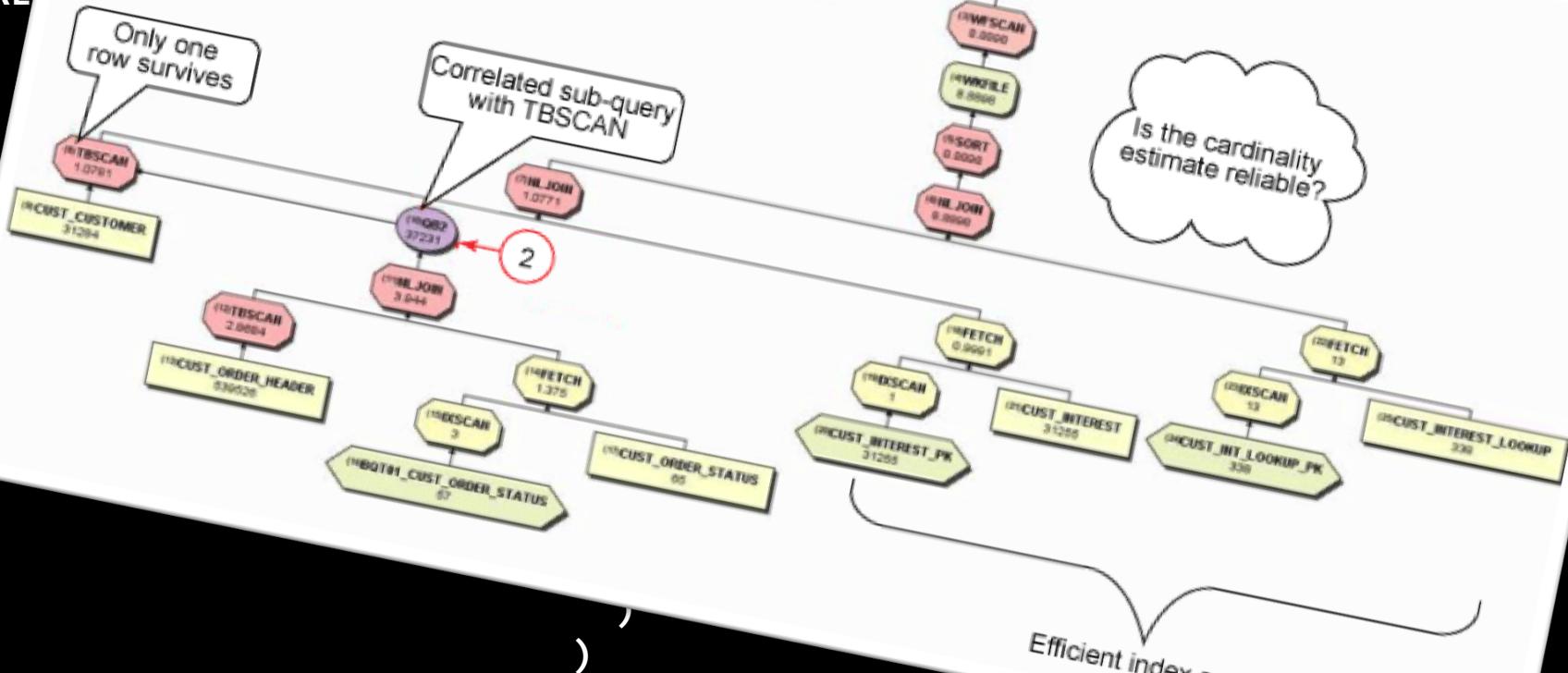




Relational databases are
sub optimal for view data!

```
SELECT CCUS.CUST_FIRST_NAME  
    , CINT.CUST_LAST_NAME  
    , CINT.CUST_INTEREST_CODE  
    , CINT.CUST_INTEREST_RANK  
FROM CUST_CCUS  
    , CUST_CINT  
WHERE
```

Evil execution plan!



```
)  
    AND CCUS.CUST_CODE = CINT.CUST_CODE  
    AND CINT.CUST_INTEREST_CODE = CILO.CUST_INTEREST_CODE  
)  
ORDER BY CCUS.CUST_LAST_NAME ASC  
        , CCUS.CUST_FIRST_NAME ASC  
        , CINT.CUST_INTEREST_RANK ASC
```



Bottom line

- Getting data should be simple
 - `select * from x where y`
- Examples:
 - **Get all products of user X**
 - **Get total price of all orders of month May**

Read side

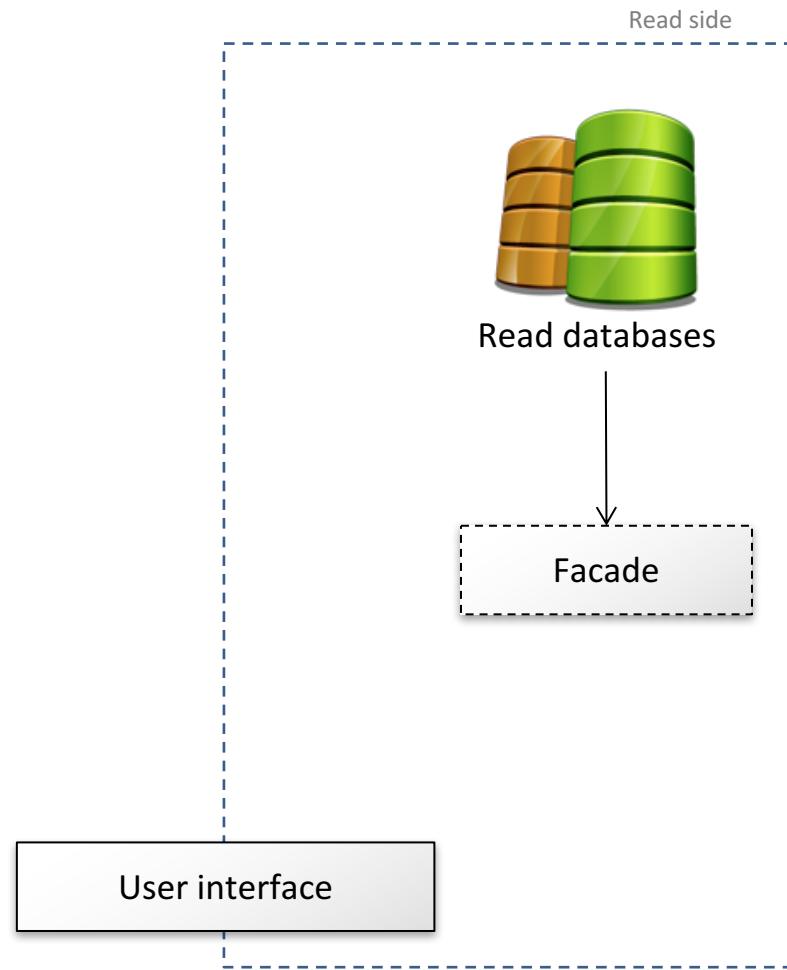


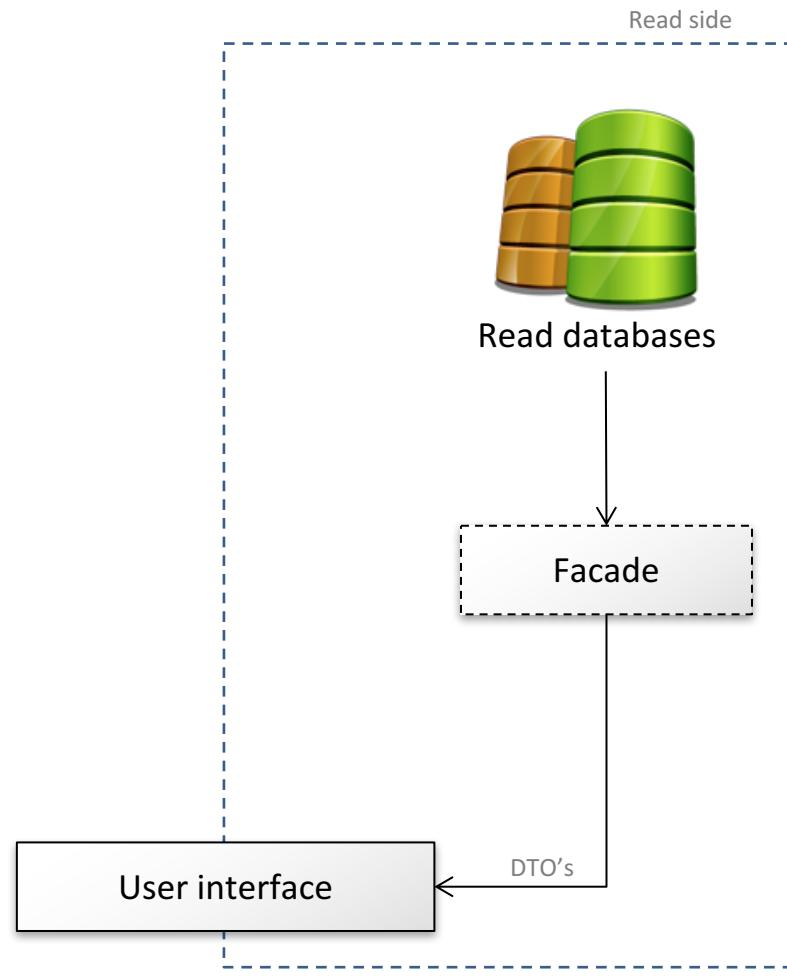
Read side



Read databases

User interface





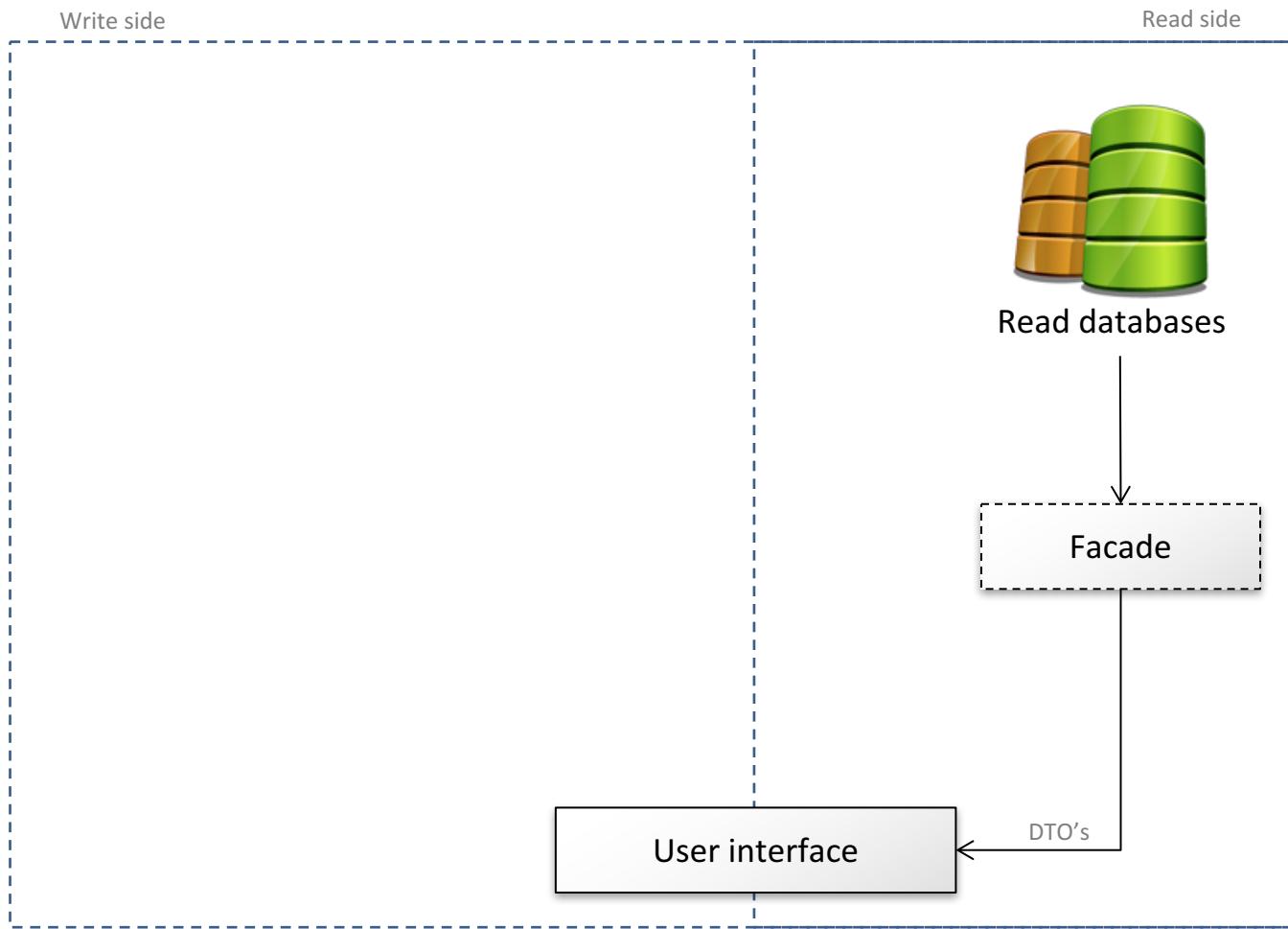


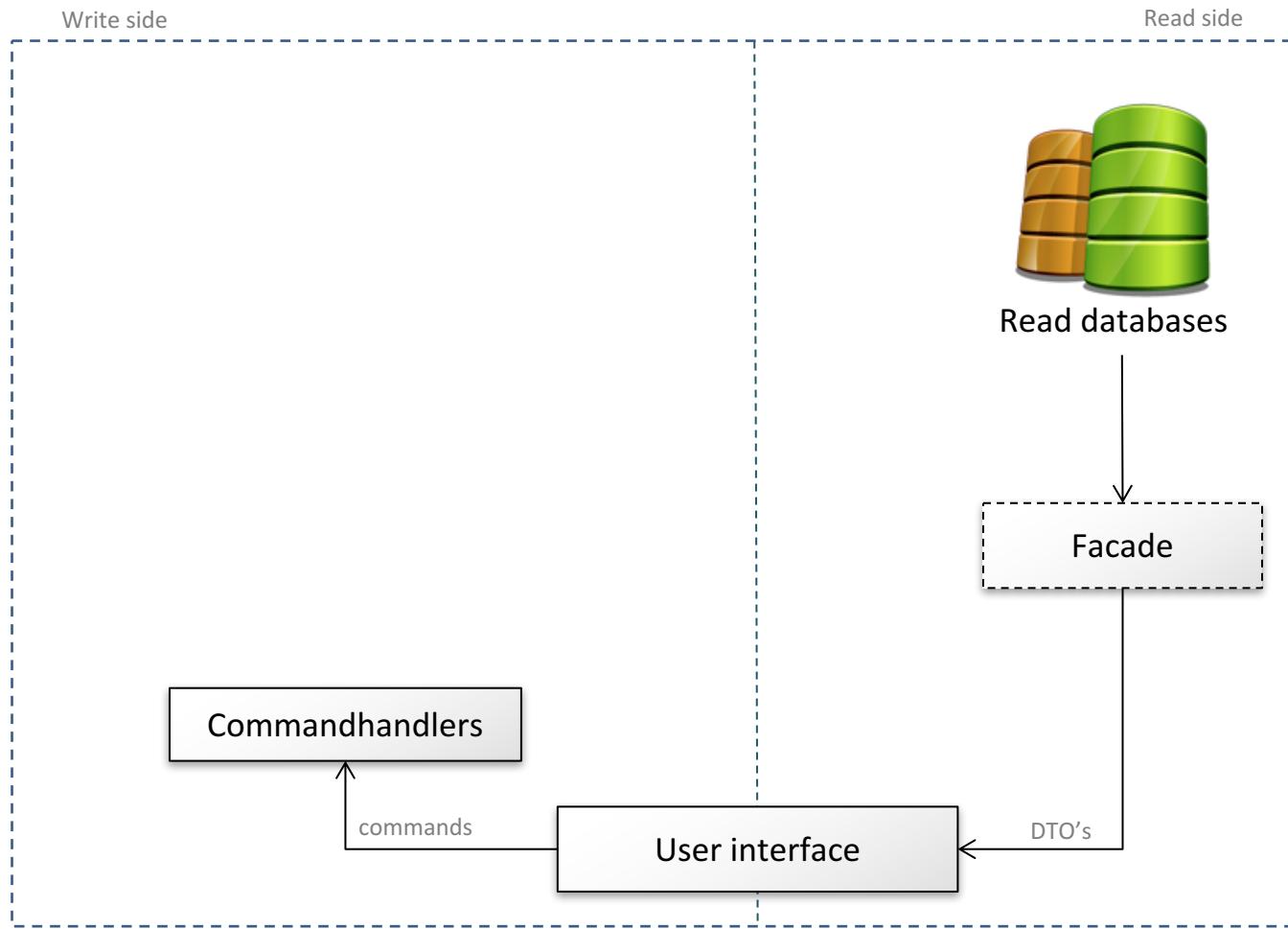
Demand for
change



I want to tell the system something









Commands

- Simple message contains all info needed
- Lower coupling (law of demeter)
- Causes a state transition
- Contains the intent of the user
- Exists in a bounded context
- Examples:
 - AddProductToShoppingCart
 - PurchaseOrder
 - MoveUserToNewAddress
 - CorrectAddressForUser
 - FinalizeOrder



Commands example

Create
Cart

Add item

Add item

Add item

Remove
item

Purchase



Users don't make changes
for nothing, intent is
important!



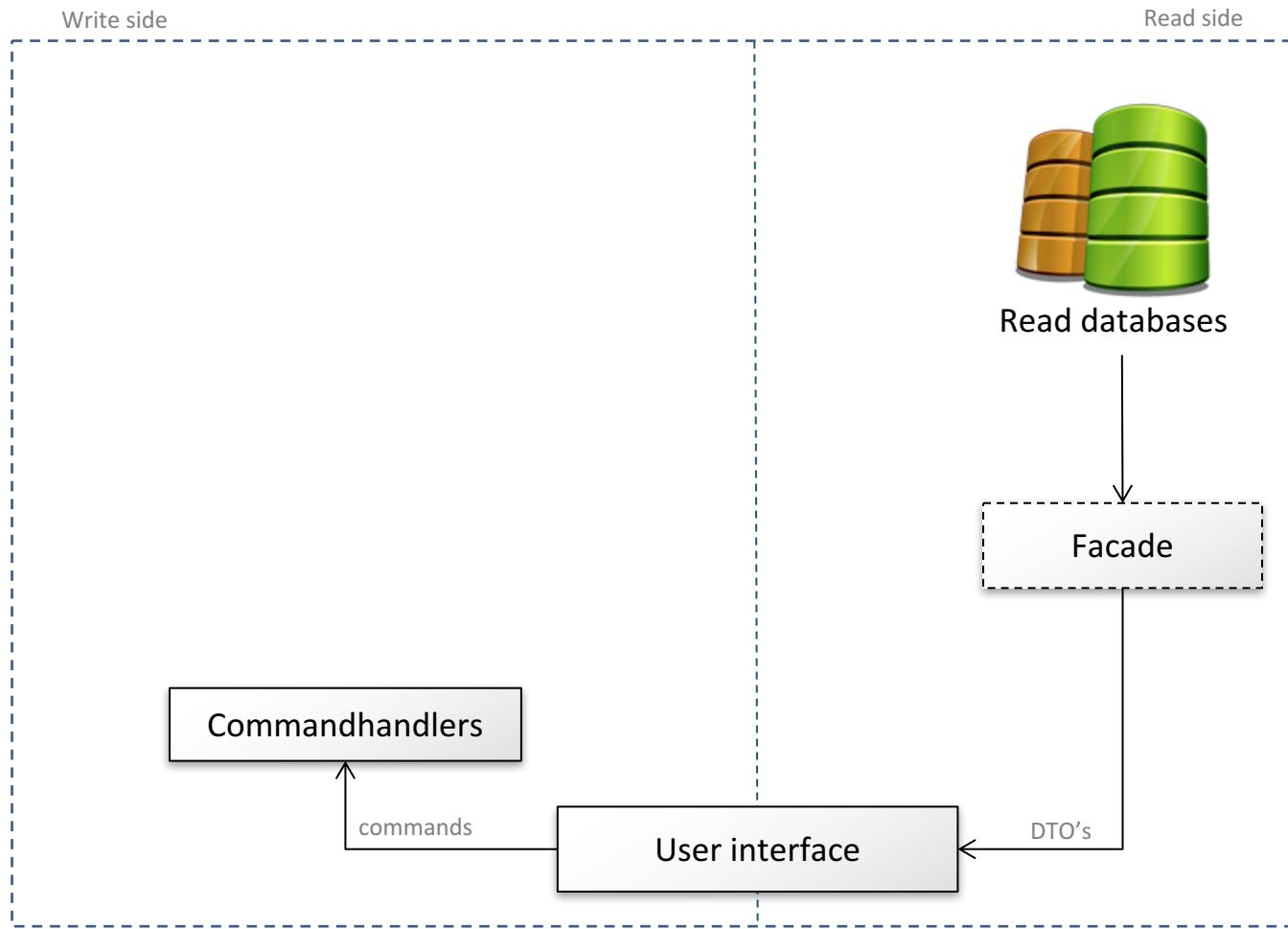
Change has intent

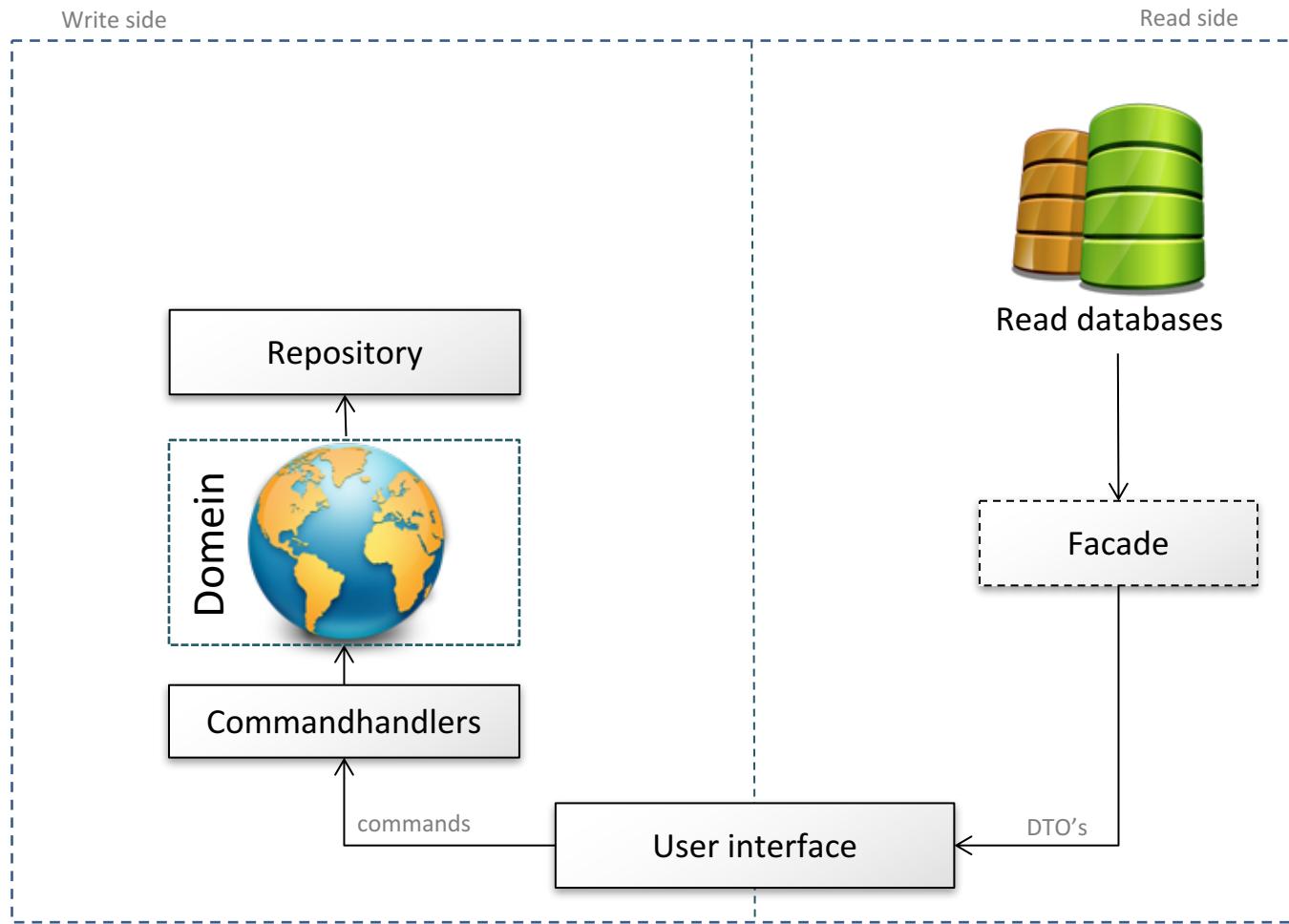
- Users don't make changes for nothing
- This intent has value!

Correct the
address for
user X

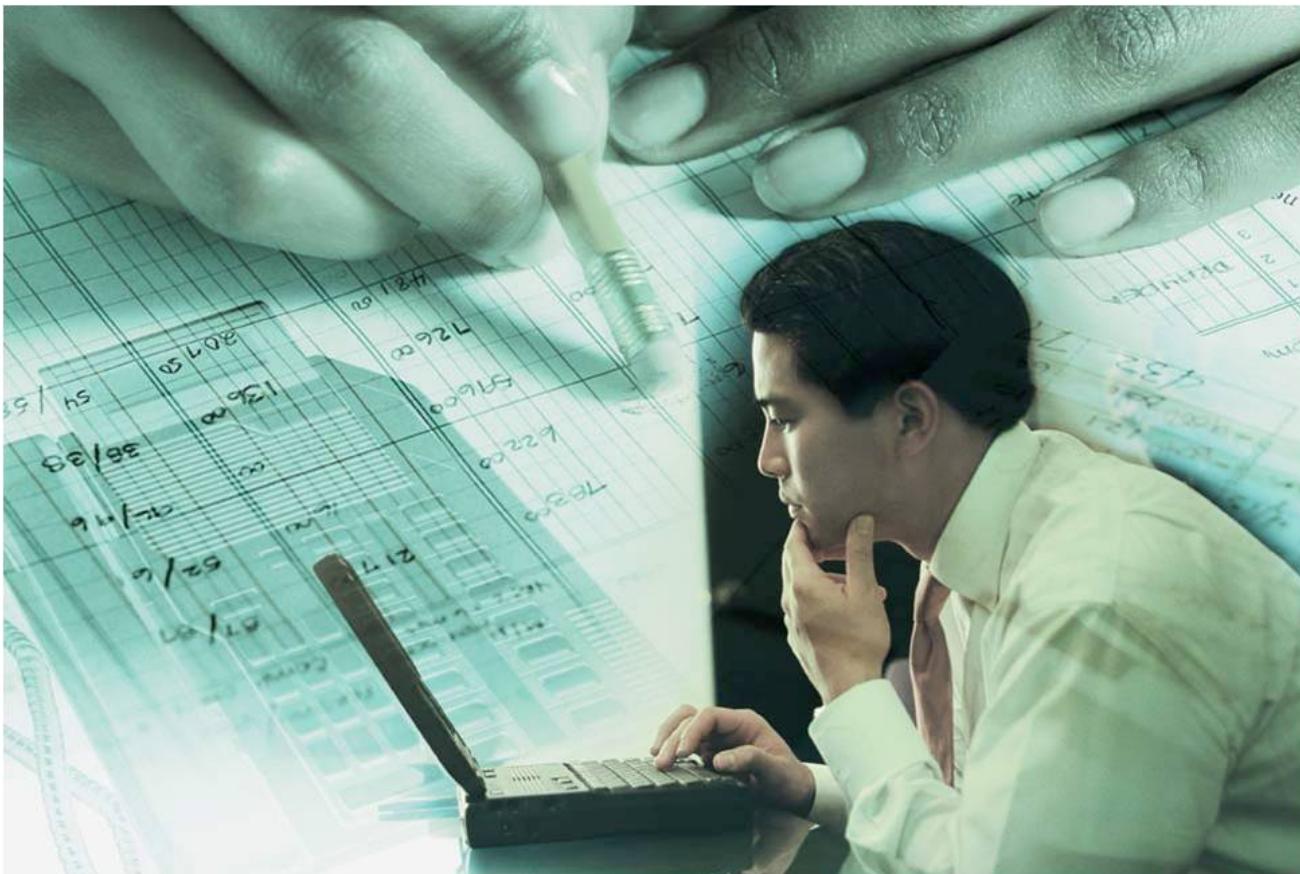
vs.

Customer X
moved to
new address





Event Sourcing





Events

- Simple message that describes an event
- Contains intent
- Contains all the data related to the event
- Past tense

CustomerMoved

{

 CustomerId,

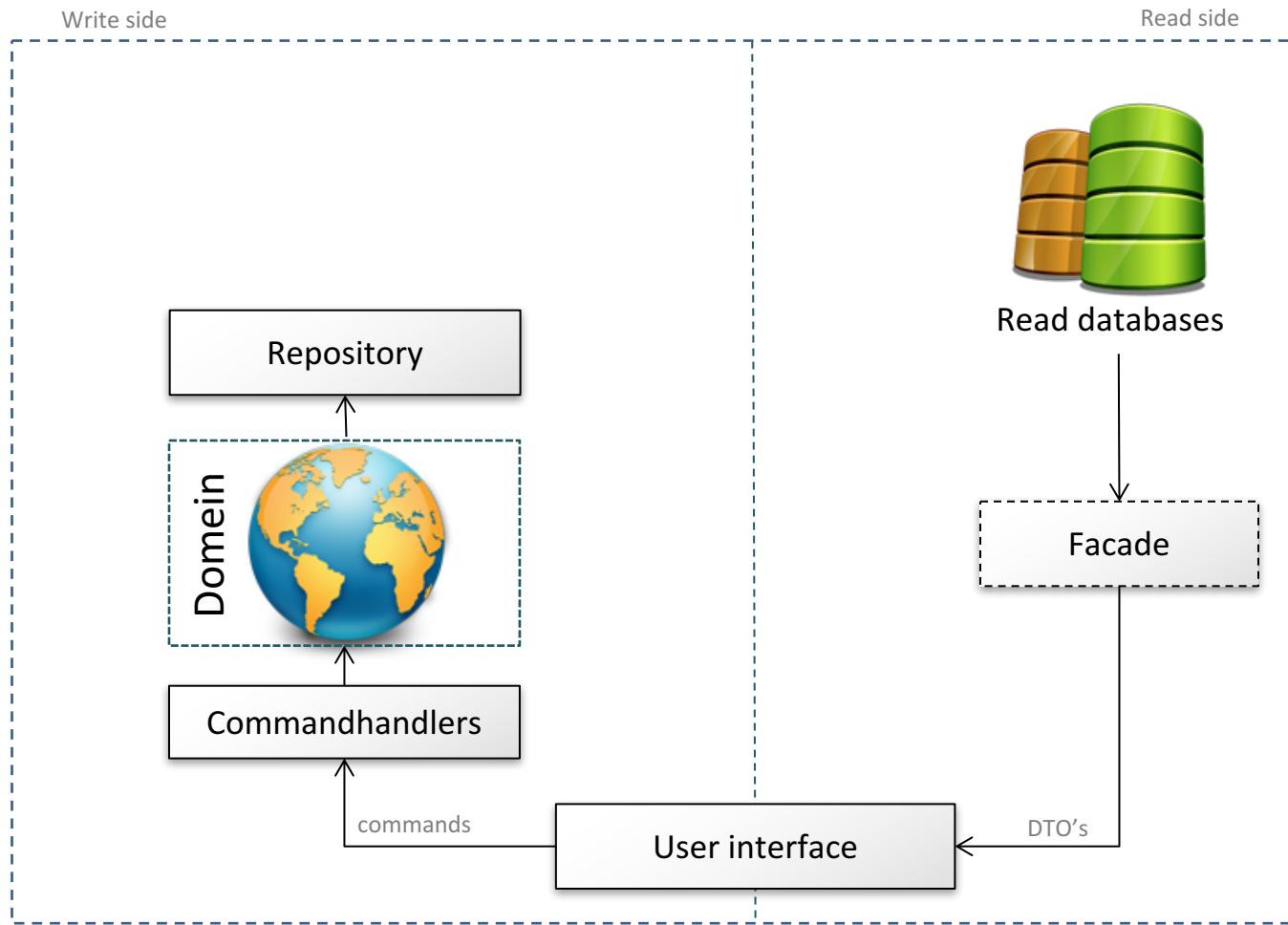
 NewAddress

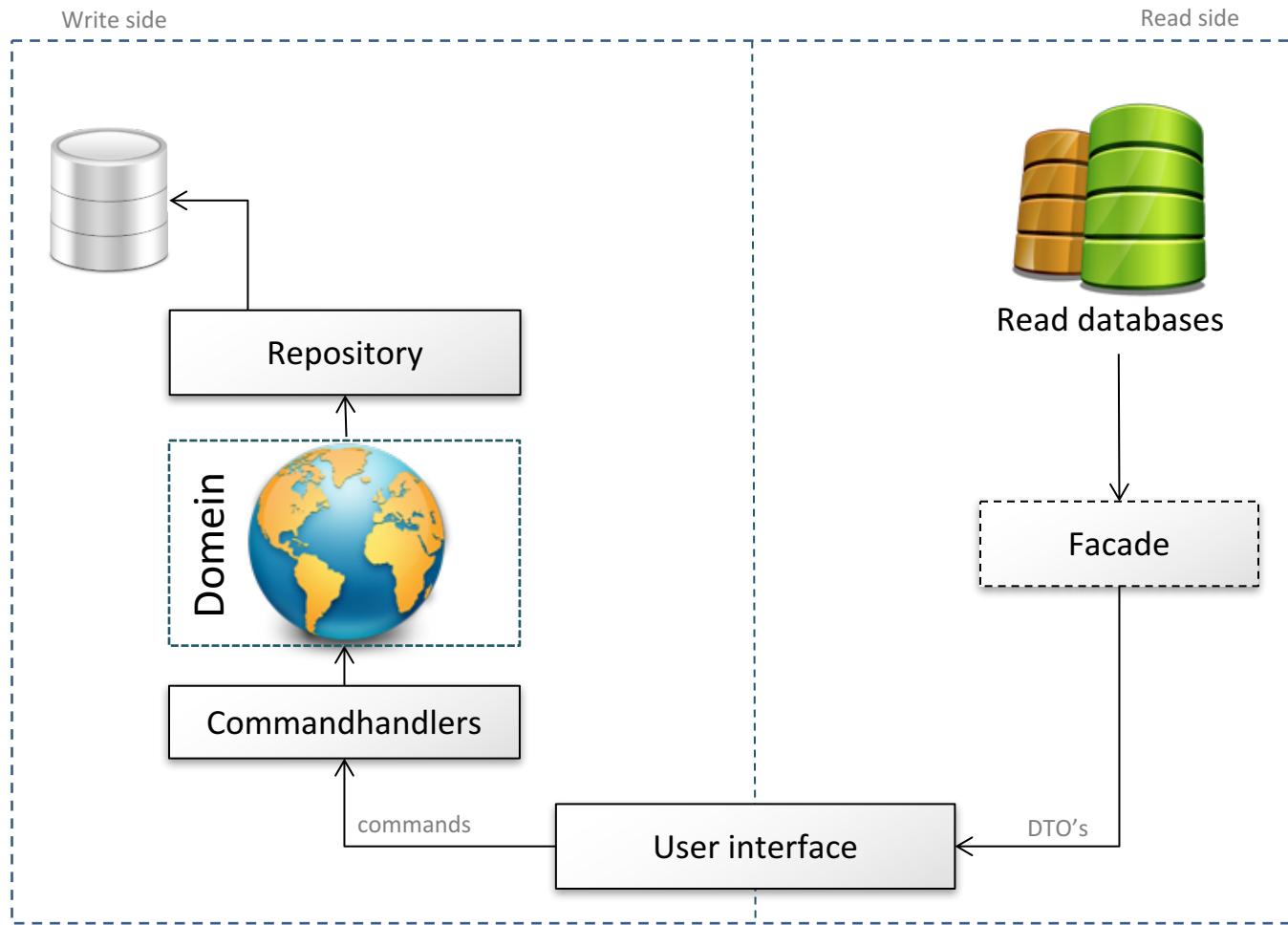
}



Transitional flow



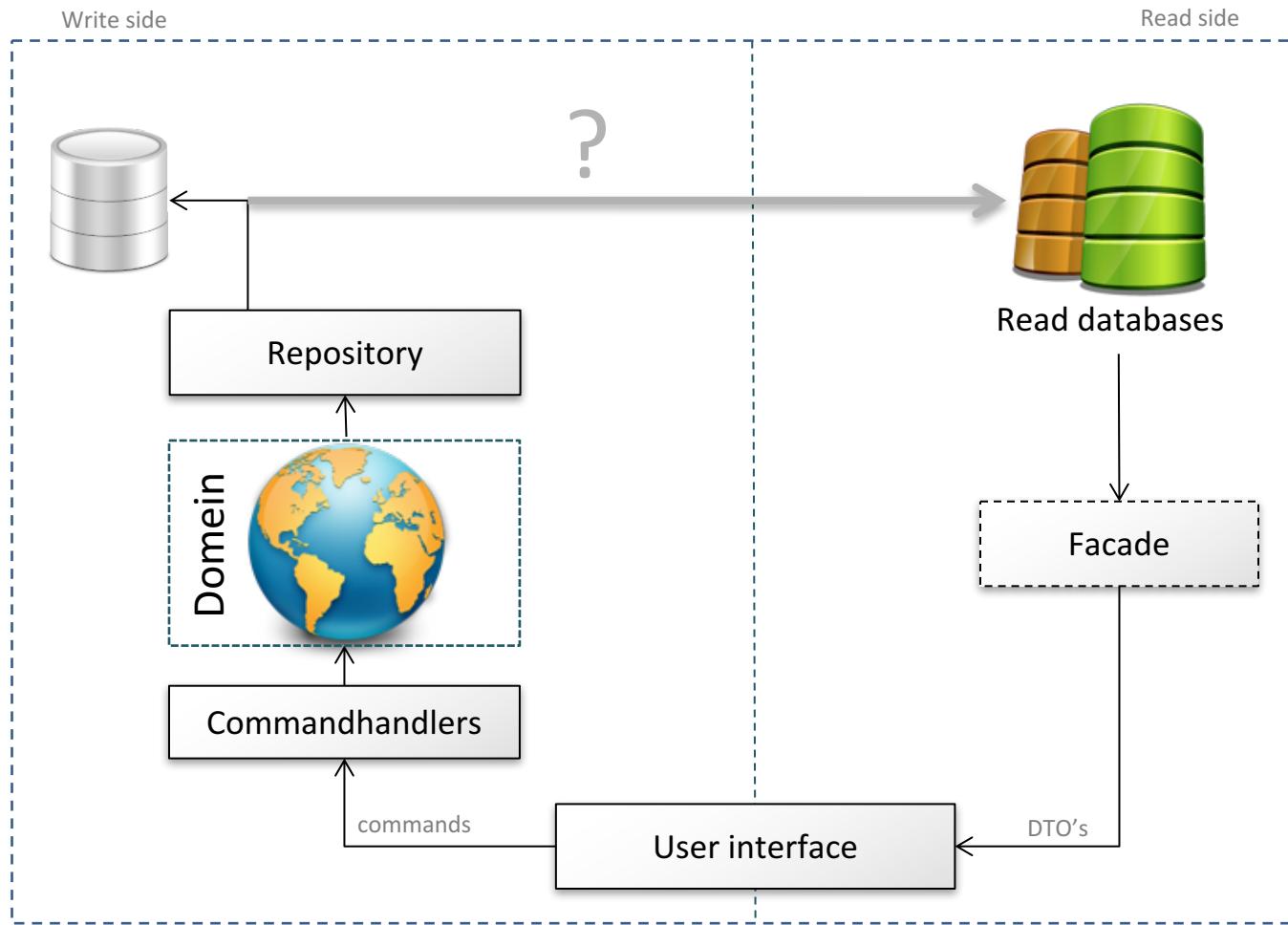


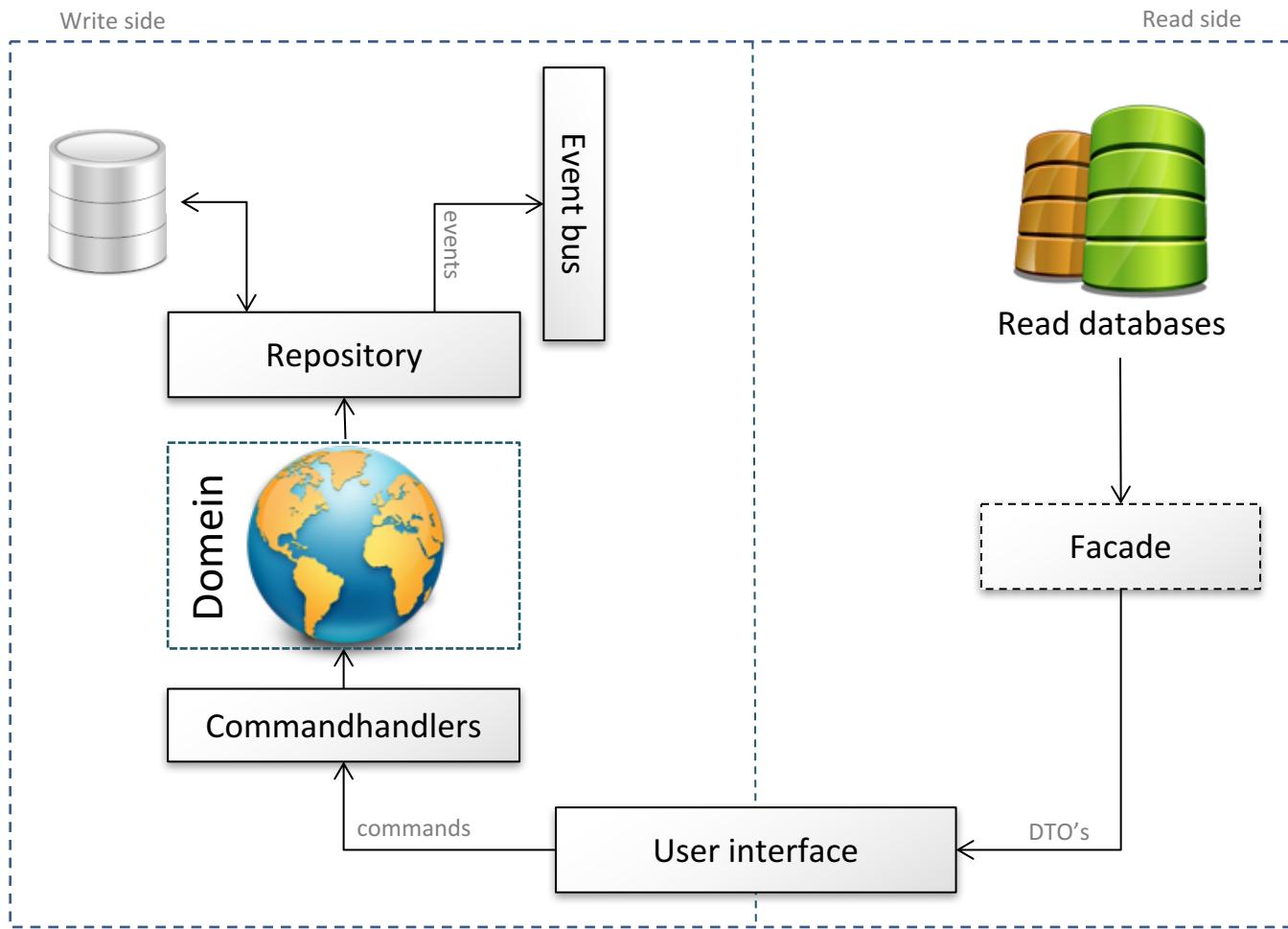


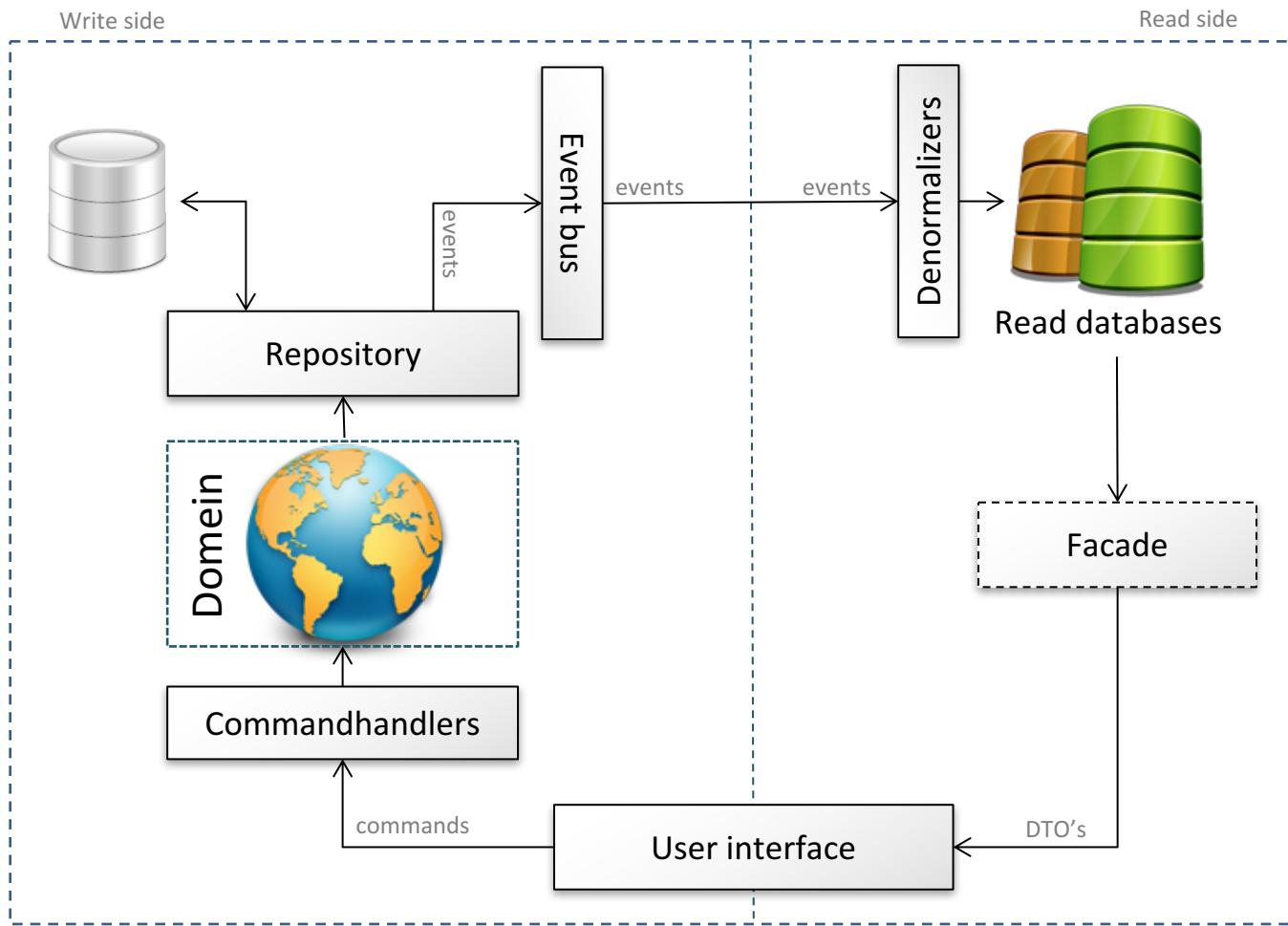


Event store

- Contains all domain events
- Does not need to be relational
- Writes are *awesomely* fast!
- Rock solid audit log
- Read models can (re)build themselves off it
- The domain uses it to get the current state
- Can be used to build any structural model you want!

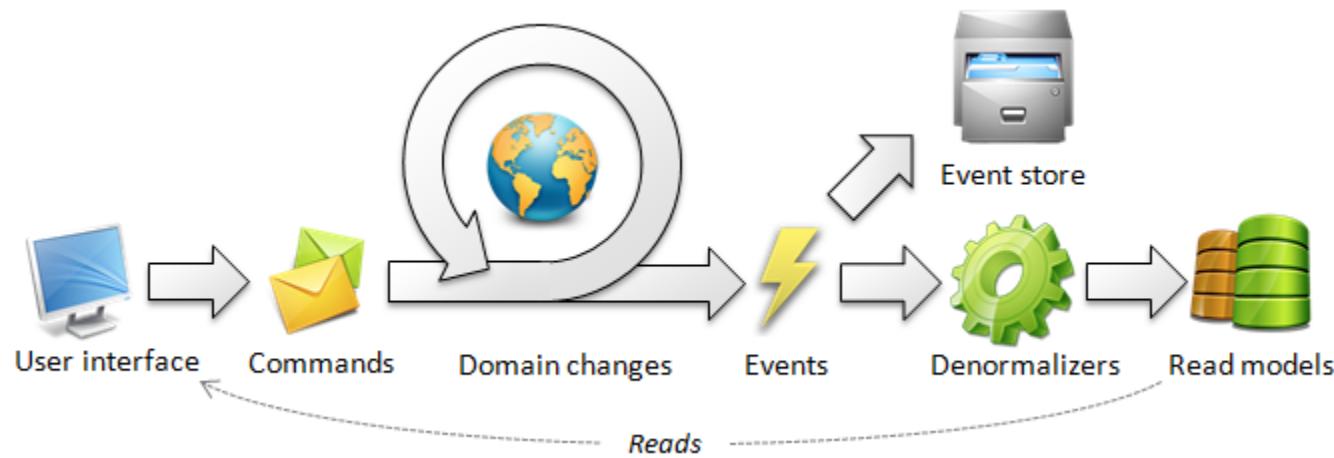








Application flow





Wrap up

- Optimize for reading and writing
- Makes changes part of the problem domain
- Free rock solid audit log
- Capture the intent of changes
- Allow multiple read models



Thank you!
You've been a great audience!

