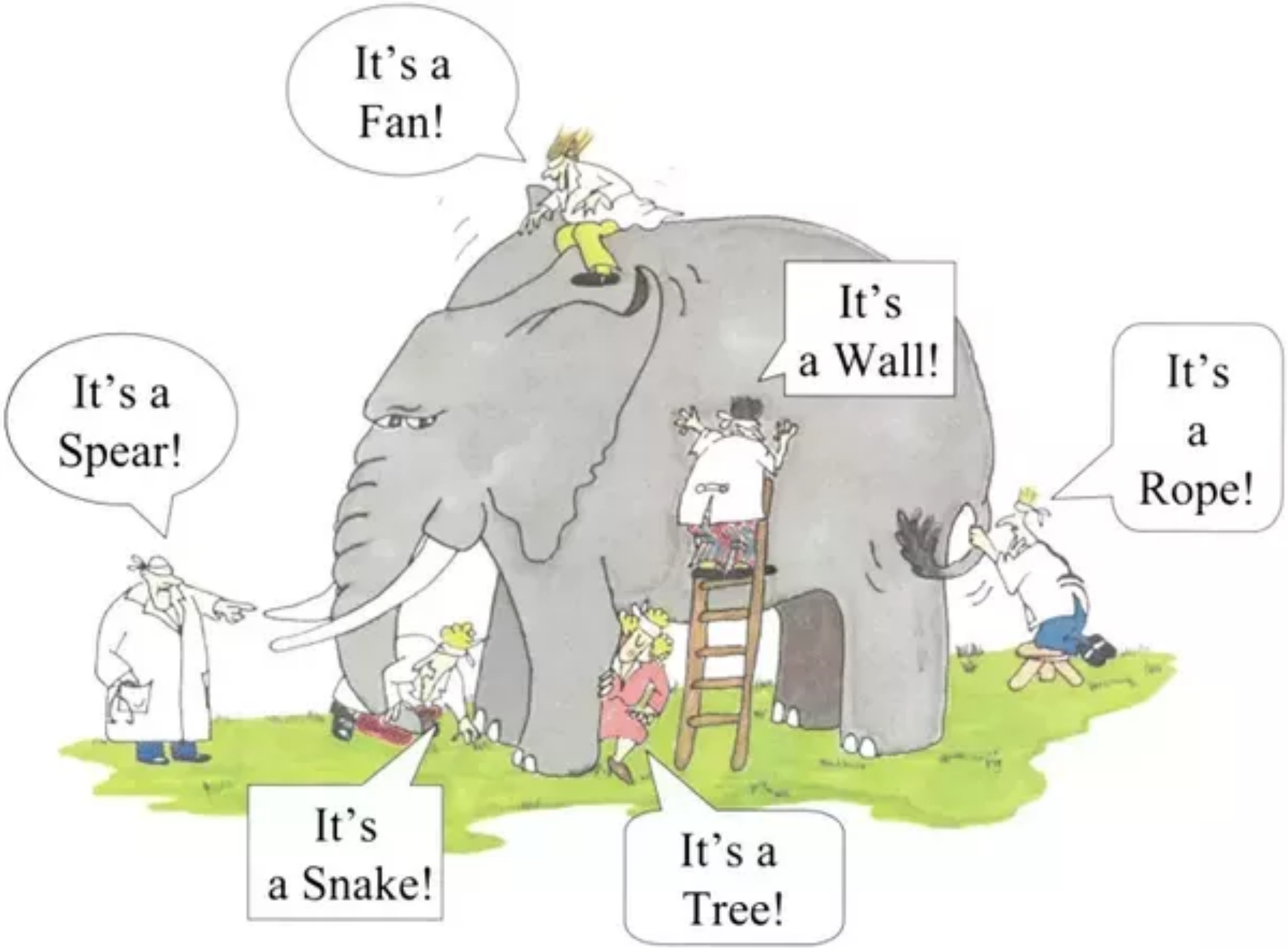
CQRS & EventSourcing With Spring & Axon

By :
Nakul Mishra

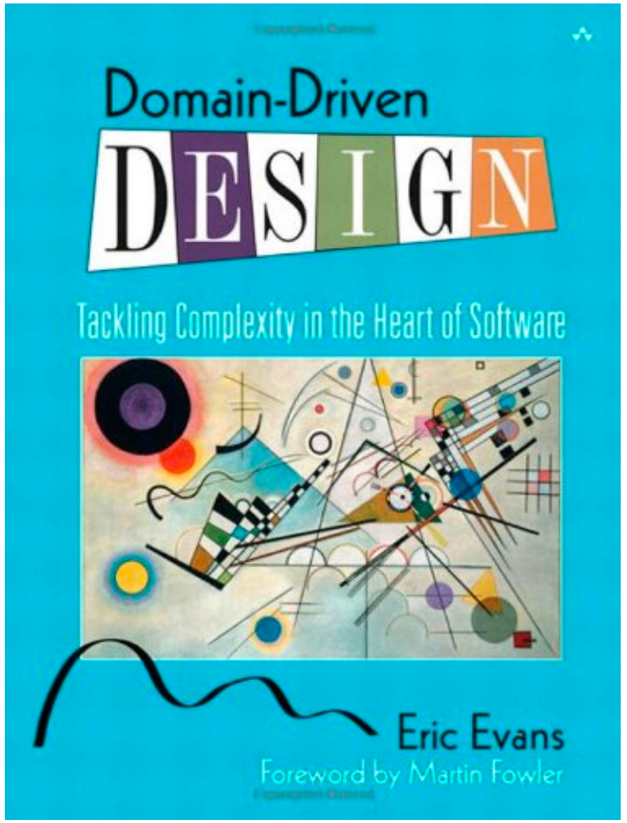
“Success by design is infinitely better than a win by chance.”


It's a Fan!
It's a Spear!
It's a Wall!
It's a Rope!
It's a Snake!
It's a Tree!

Code is like water, it reflects

Our perception

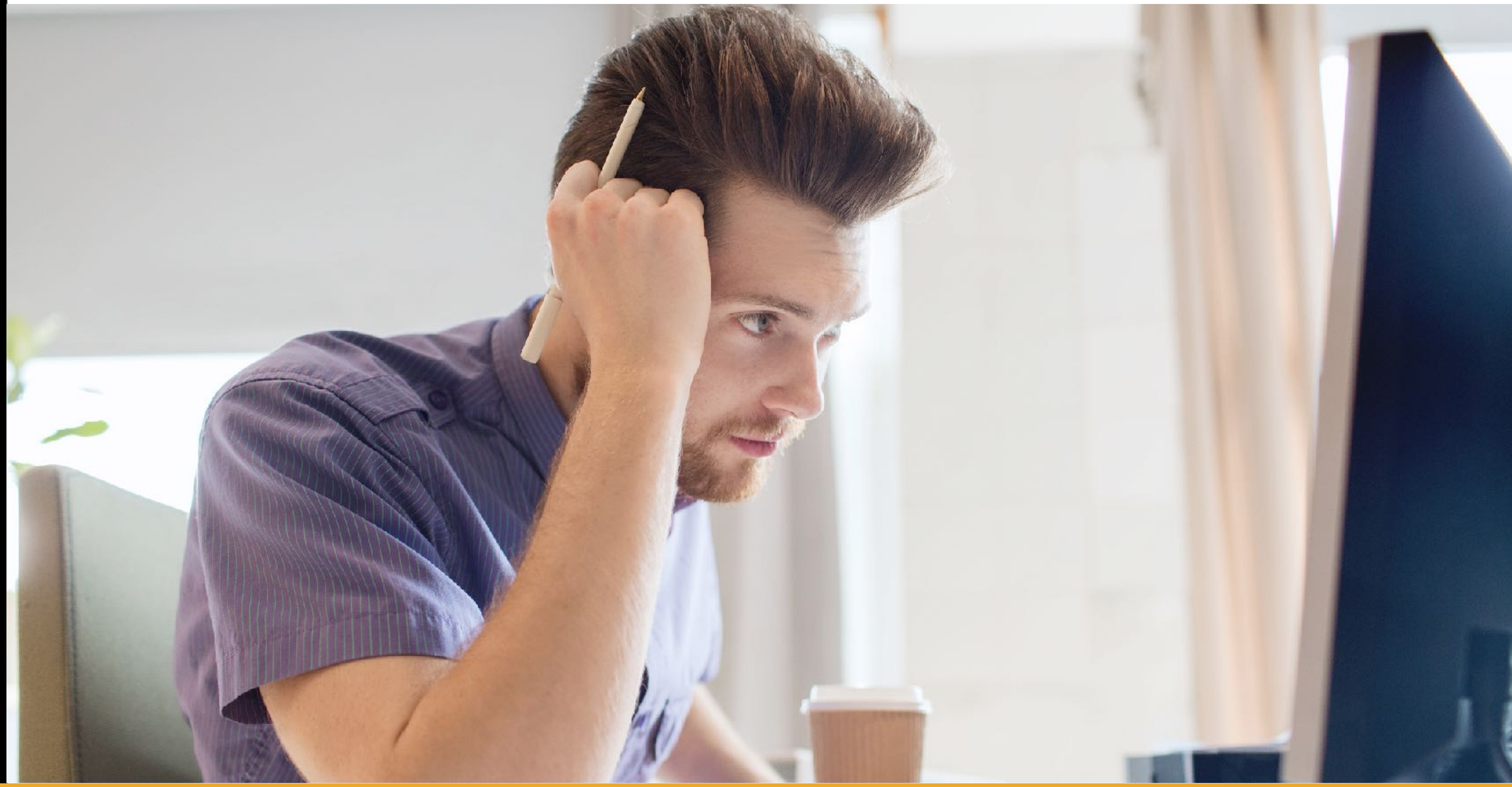
Business Reality


Domain-Driven
DESIGN
Tackling Complexity in the Heart of Software
Eric Evans
Foreword by Martin Fowler

DDD

DDD - Focus on domain

DDD In Practice?



DDD in a nutshell

Place behaviour in “Domain Model”

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Code should reflect “Business REALITY”
(Ubiquitous language)

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Provide unit of consistency
across Domain Model via “Aggregate”

DDD in a nutshell

Place behaviour in “Domain Model”

Code should reflect “Business REALITY”
(Ubiquitous language)

Provide unit of consistency
across Domain Model via “Aggregate”

Define clear “bounded context” &
protect your model.

Aggregate

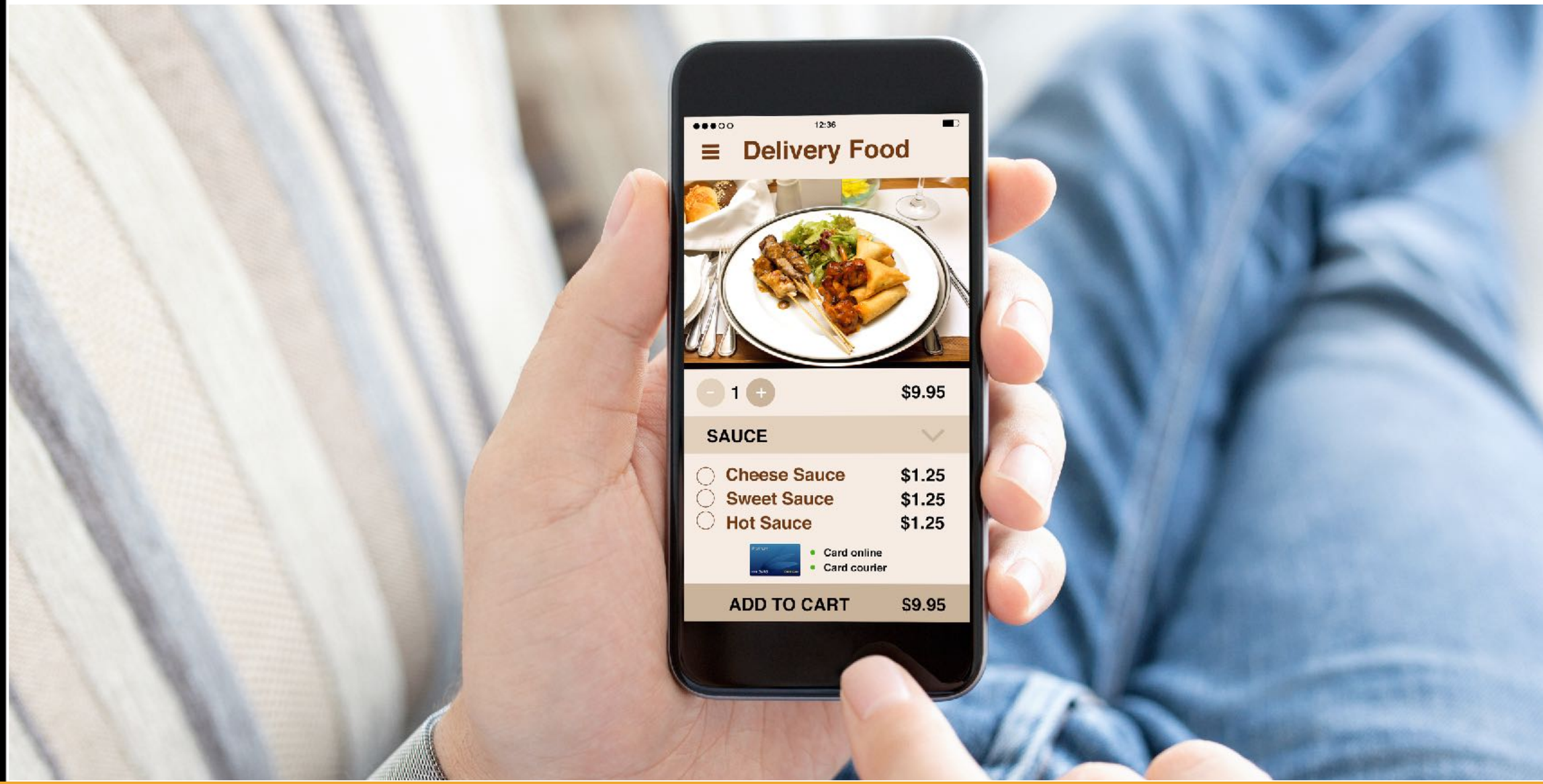
Event Sourcing

Traditional app

Traditional app - What Happened

12345	1	Veggie Burger	Shipped

Event sourcing



Event Sourcing - What ACTUALLY Happened

Item Added	1	Veggie Burger

Event Sourcing - What ACTUALLY Happened

Item Added	1	Veggie Burger
Item Added	1	Salad

Event Sourcing - What ACTUALLY Happened

Item Added	1	Veggie Burger
Item Added	1	Salad
Item Added	1	Ice cream

Event Sourcing - What ACTUALLY Happened

Item Added	1	Veggie Burger
Item Added	1	Salad
Item Added	1	Ice cream
Item Removed	1	Ice cream

Event Sourcing - What ACTUALLY Happened

Item Added	1	Veggie Burger
Item Added	1	Salad
Item Added	1	Ice cream
Item Removed	1	Ice cream
Item Removed	1	Salad

Event Sourcing - What ACTUALLY Happened

Item Added	1	Veggie Burger
Item Added	1	Salad
Item Added	1	Ice cream
Item Removed	1	Ice cream
Item Removed	1	Salad
OrderConfirmed		

Event Sourcing - What ACTUALLY Happened

Item Added	1	Veggie Burger
Item Added	1	Salad
Item Added	1	Ice cream
Item Removed	1	Ice cream
Item Removed	1	Salad
OrderConfirmed		
Order Shipped		

Event Sourcing - What ACTUALLY Happened

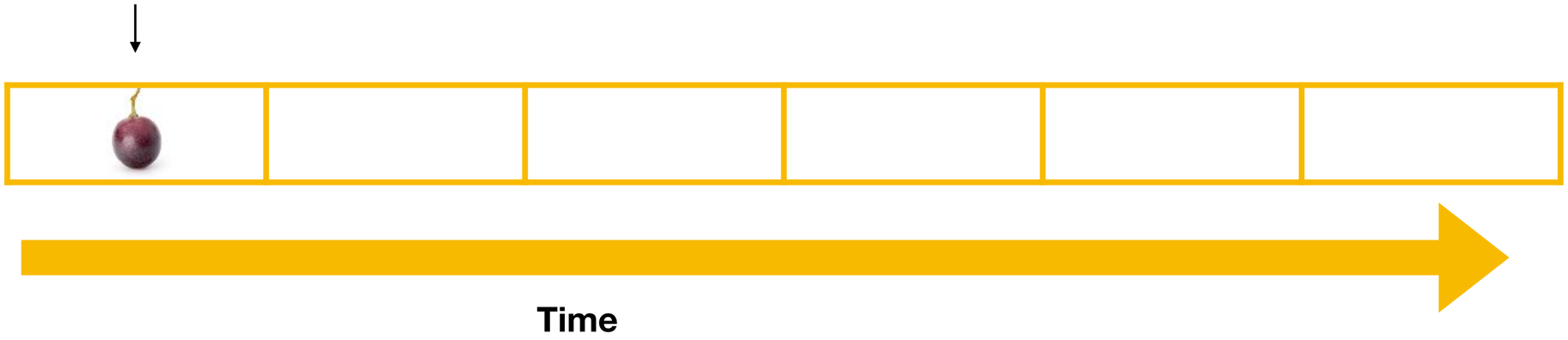
Item Added	1	Veggie Burger
Item Added	1	Salad
Item Added		Ice cream
Item Removed		Ice cream
Item Removed		Salad
OrderConfirmed		
Order Shipped		

Food for Big Data, ML, etc.

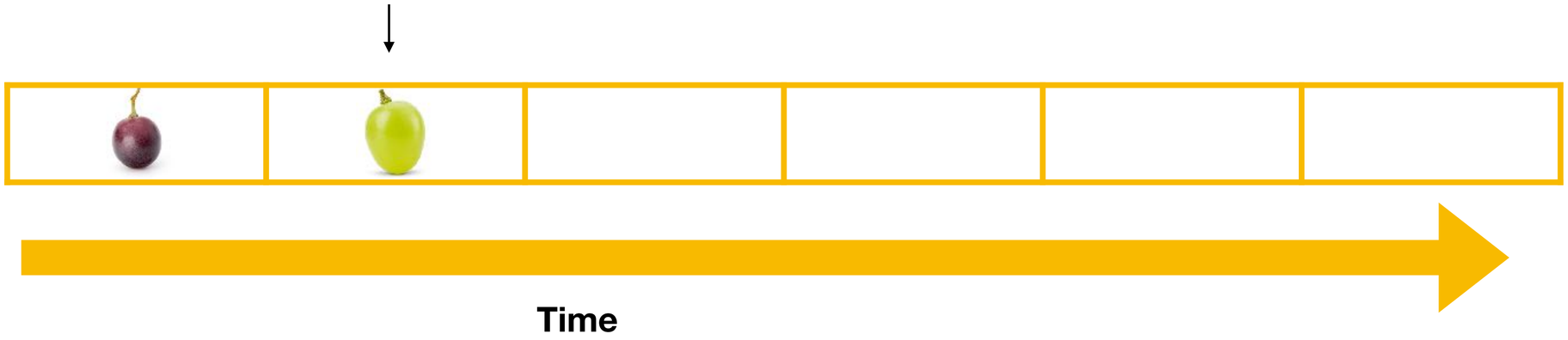
Where to store events?

Event Store

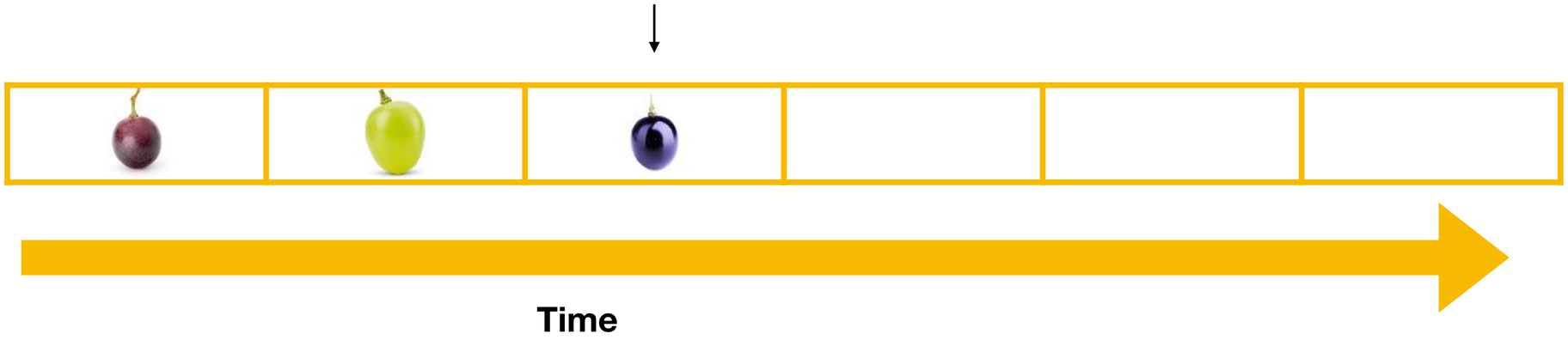
Event Store



Event Store



Event Store



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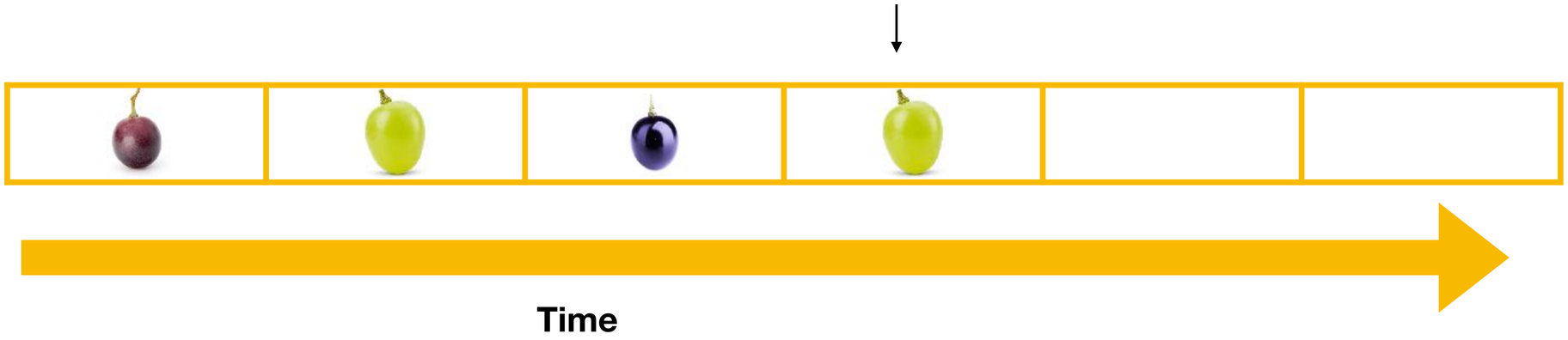

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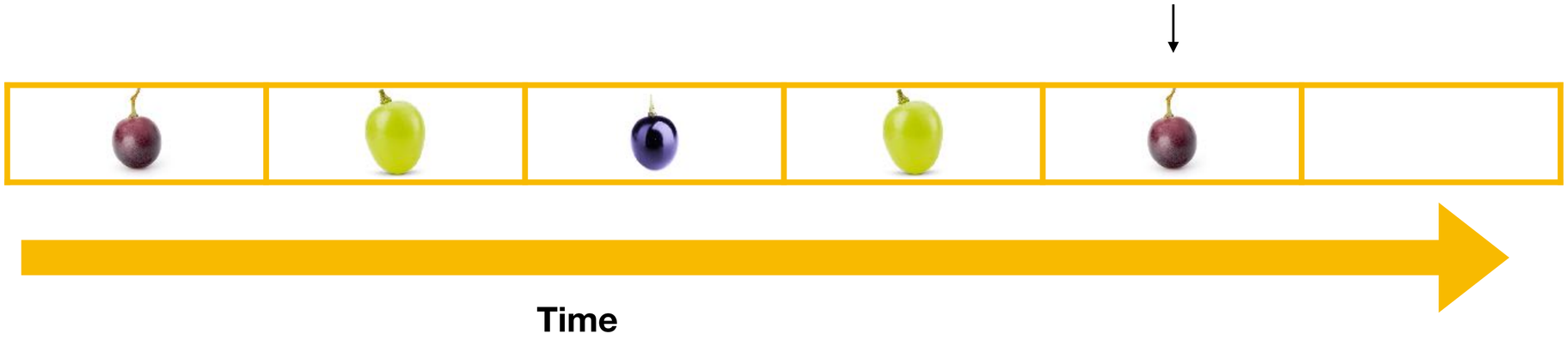

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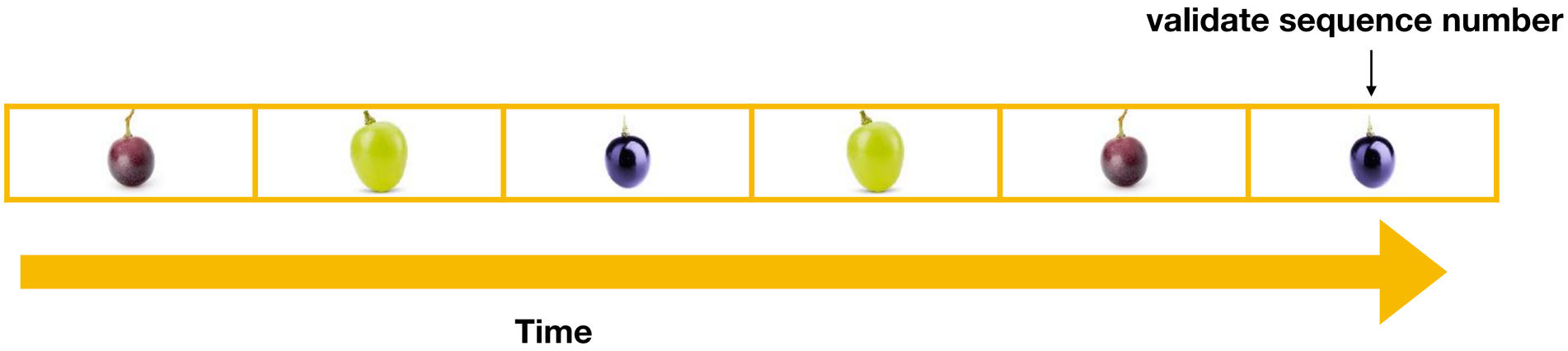


Event Store Implementation

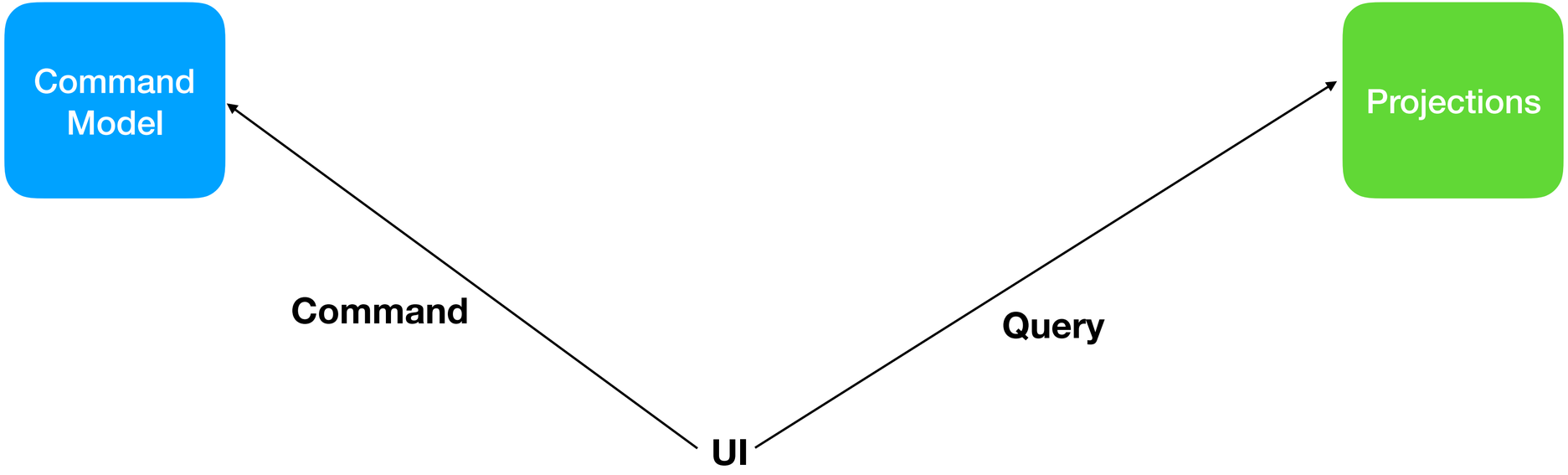
- EventStore - Greg Young
- AxonDB - AxonIQ
- Relational DBMS
- Roll out your own….

CQRS

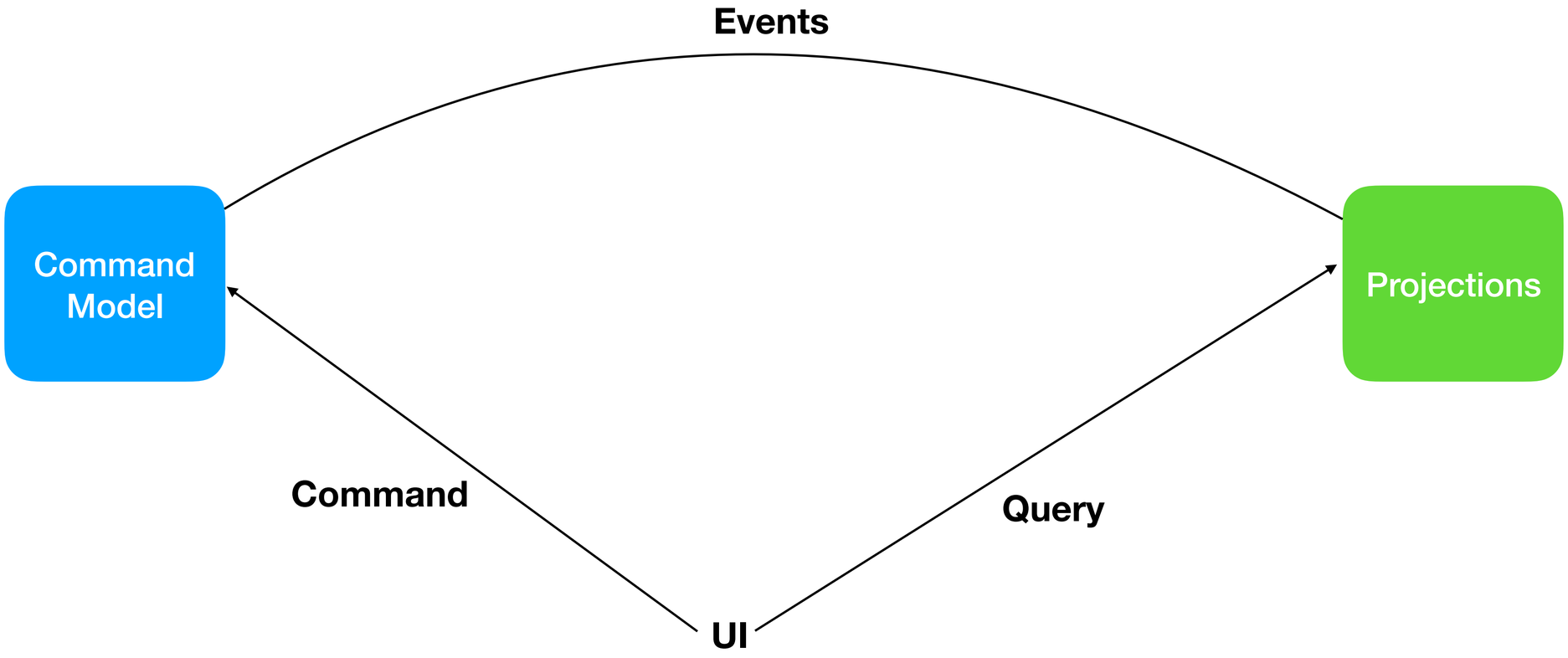
Command

Query (Projections)

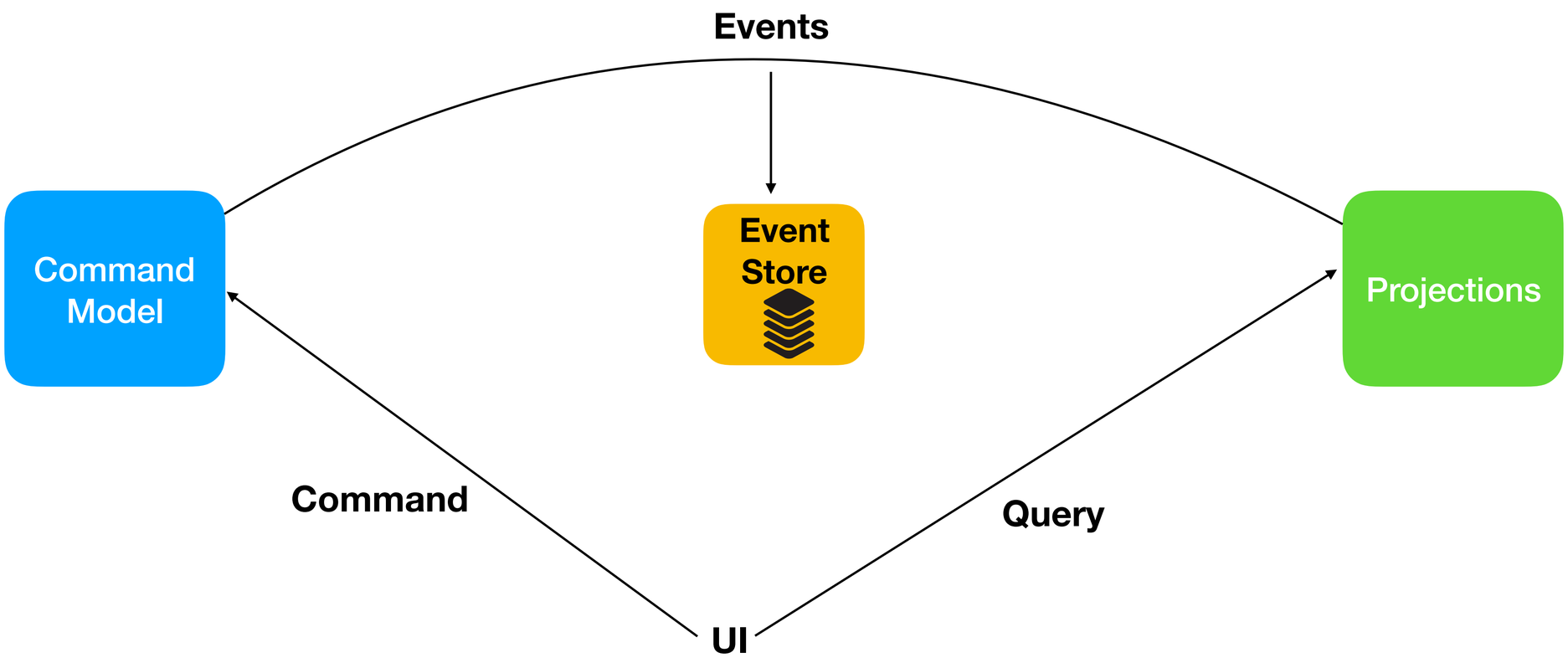
CQRS



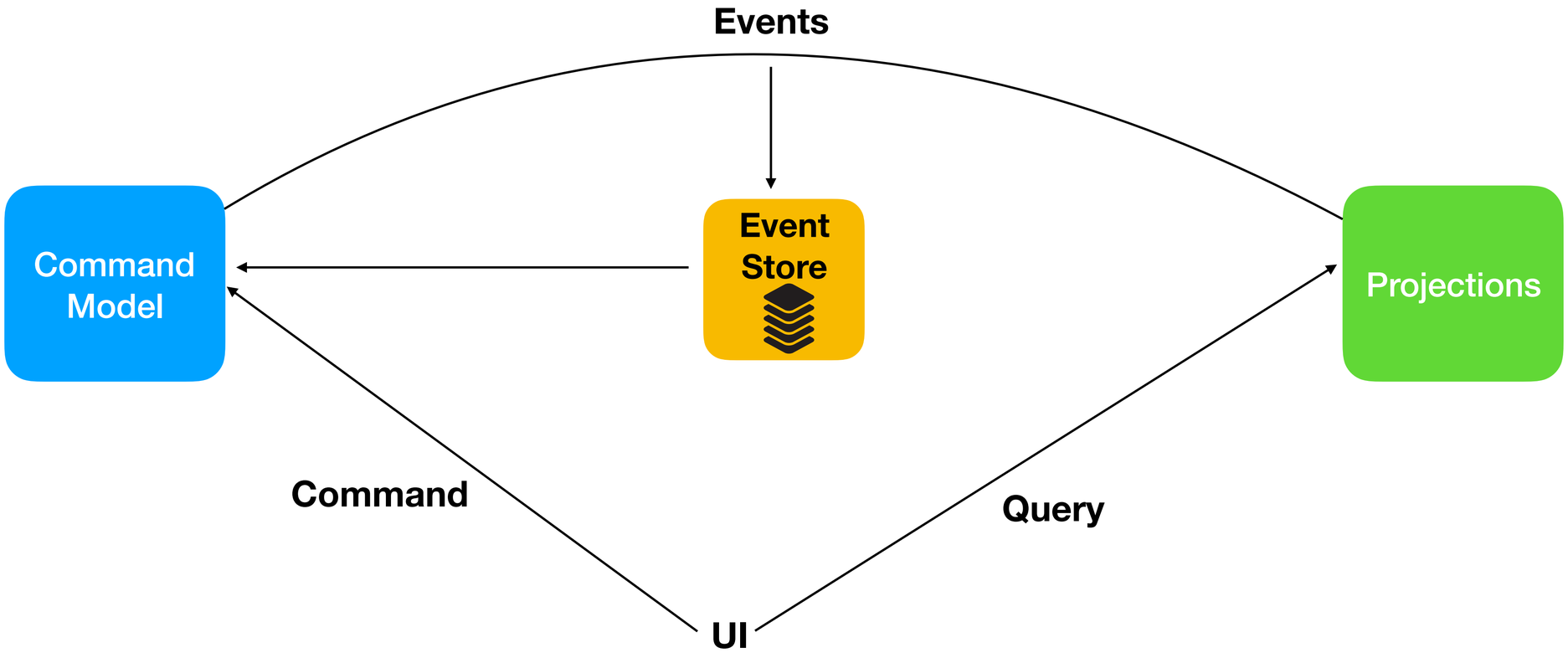
CQRS



CQRS

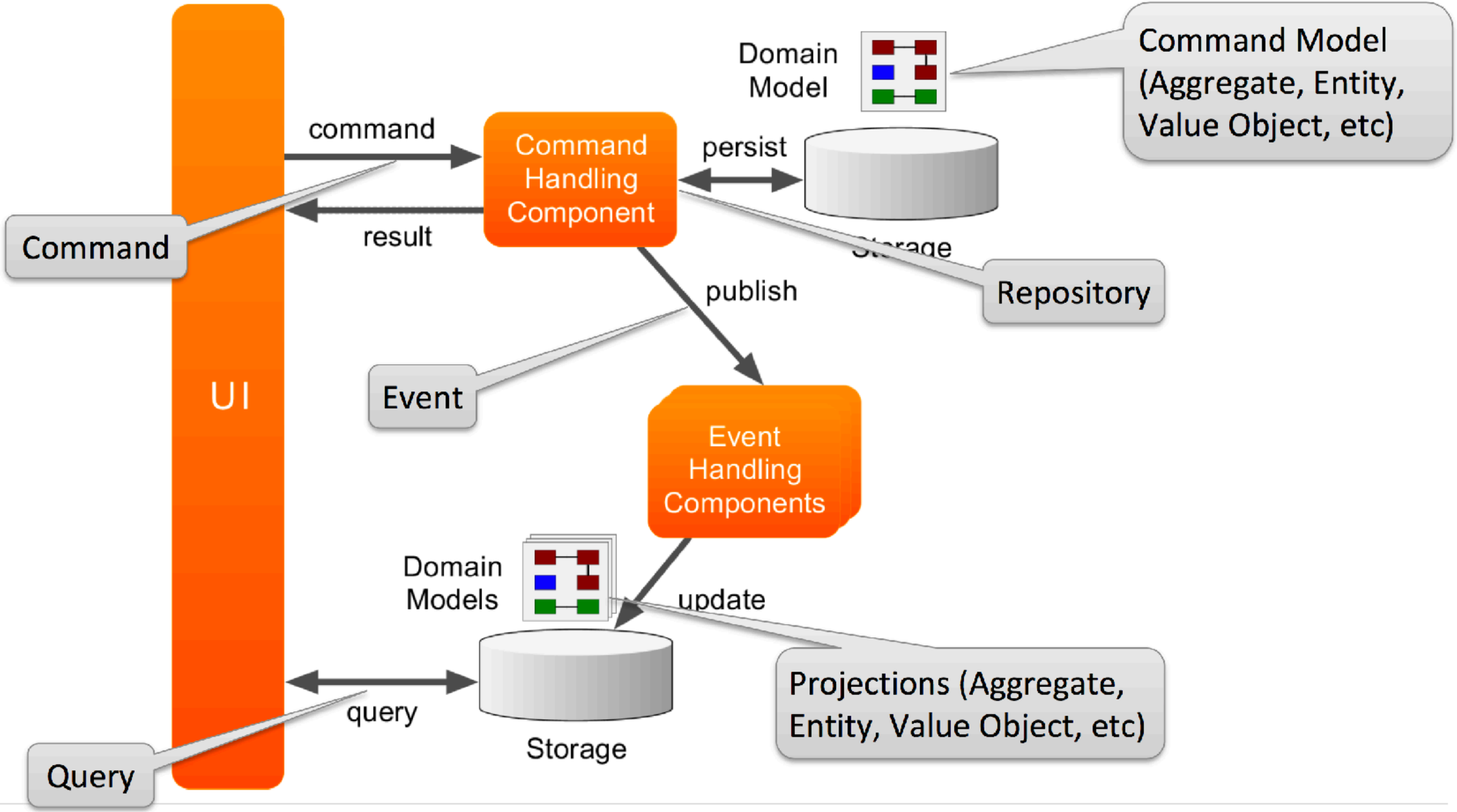

Events
Command Model
Event Store
Projections
Command
Query
UI

CQRS


Events
Command Model
Event Store
Projections
Command
Query
UI

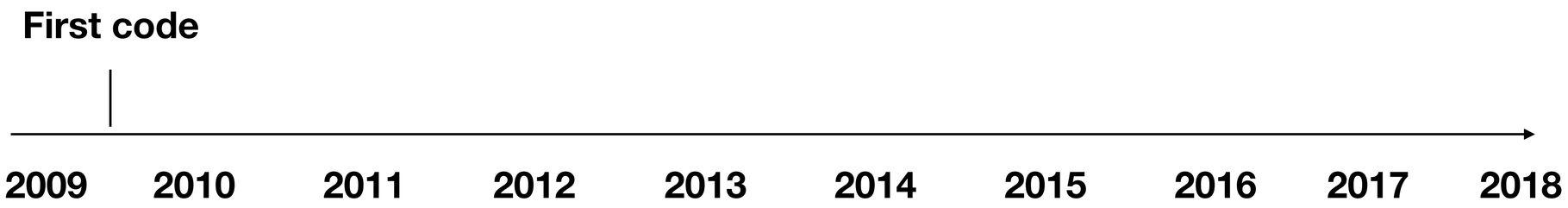
IT'S EASY!

Details

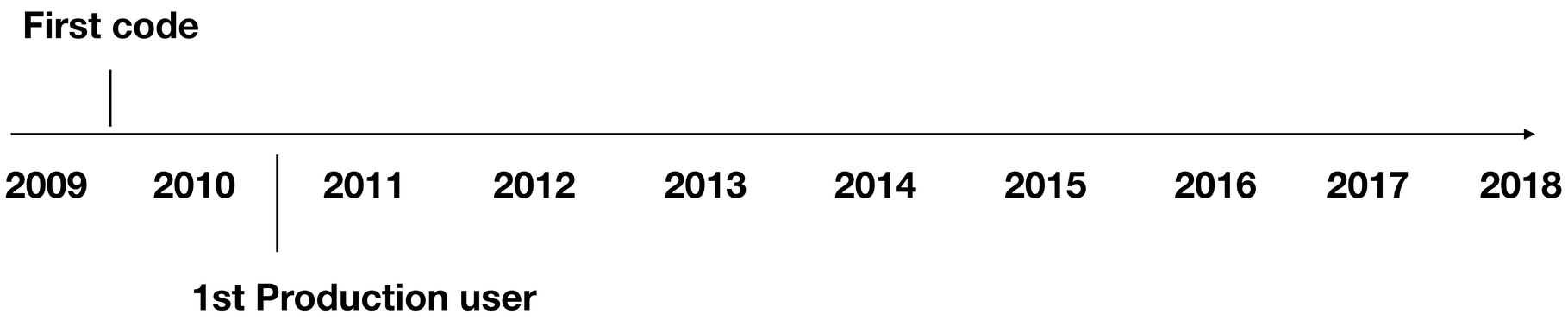

UI
command
result
Command
Command Handling Component
persist
Domain Model
Command Model (Aggregate, Entity, Value Object, etc)
Repository
publish
Event
Event Handling Components
Domain Models
update
Projections (Aggregate, Entity, Value Object, etc)
query
Storage
Query

AxonFramework

Axon History



Axon History



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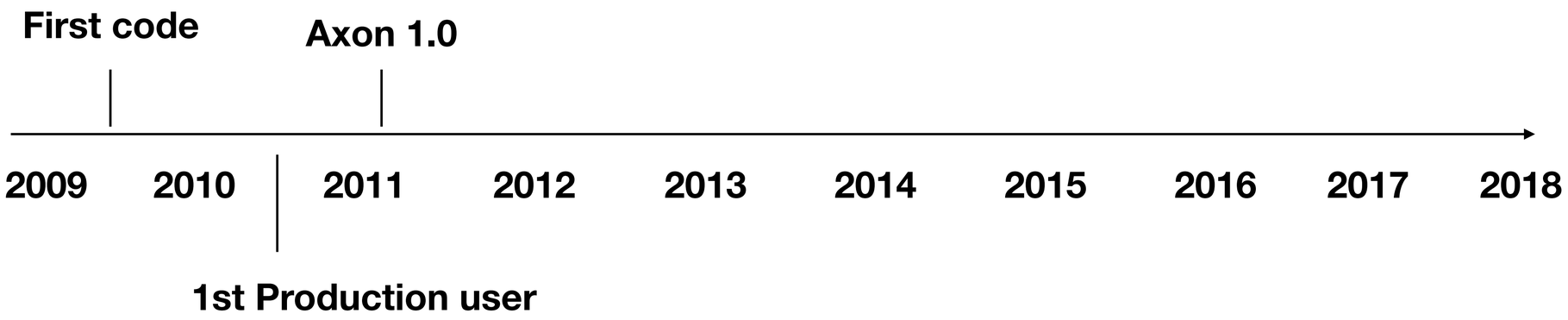

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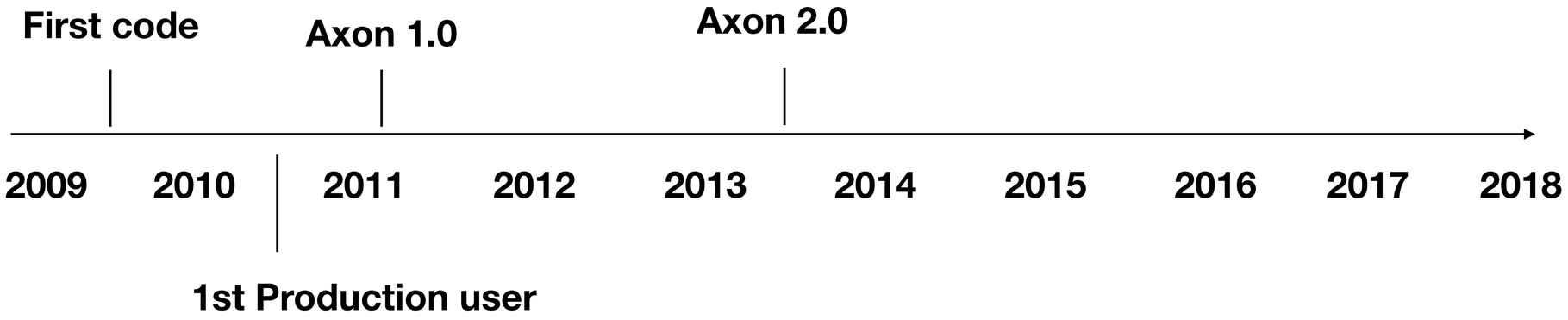

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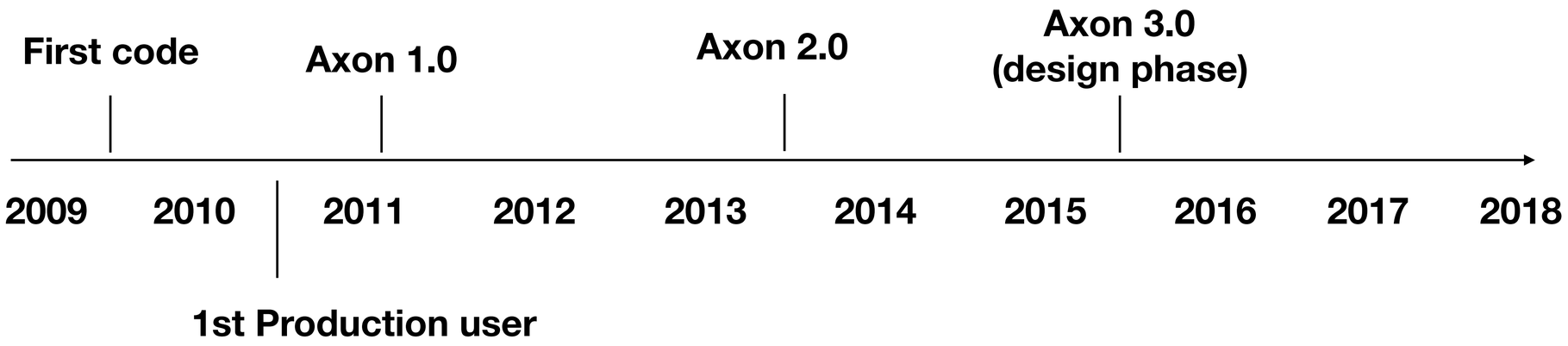

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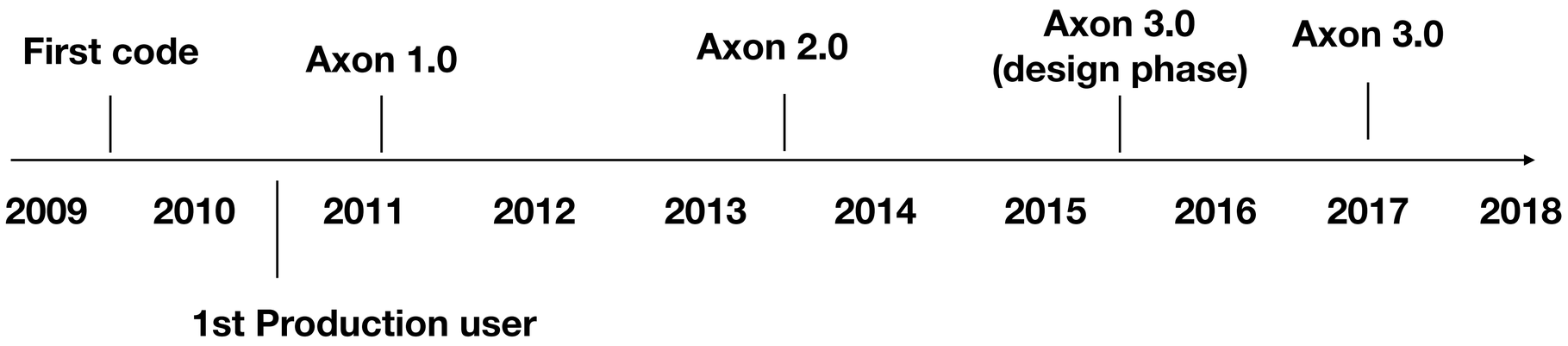

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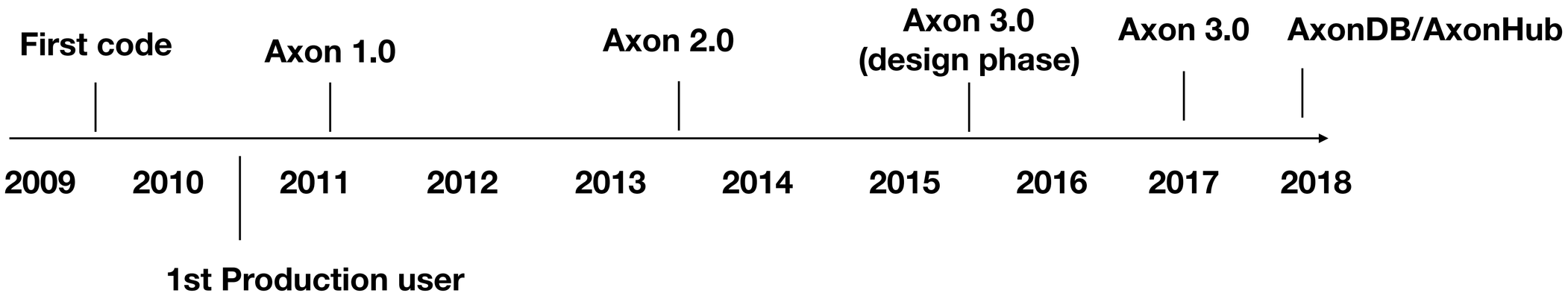
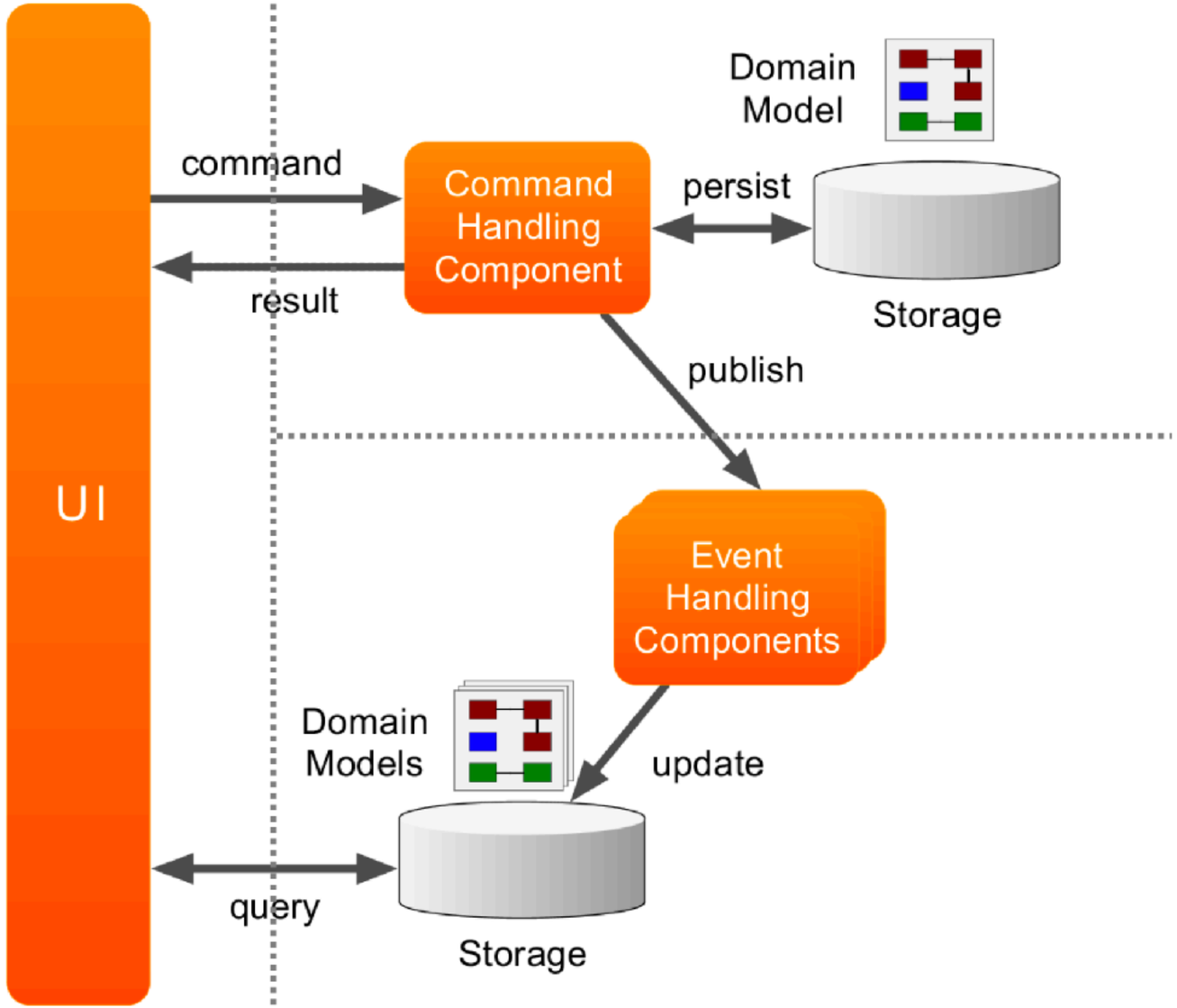


Axon, Location Transparency + Other Stuff



Demo

https://github.com/nklmish/axon-casino

“I hear and I forget. I see and I remember. I do and I understand.”- Confucius

Complex Transaction Management ?

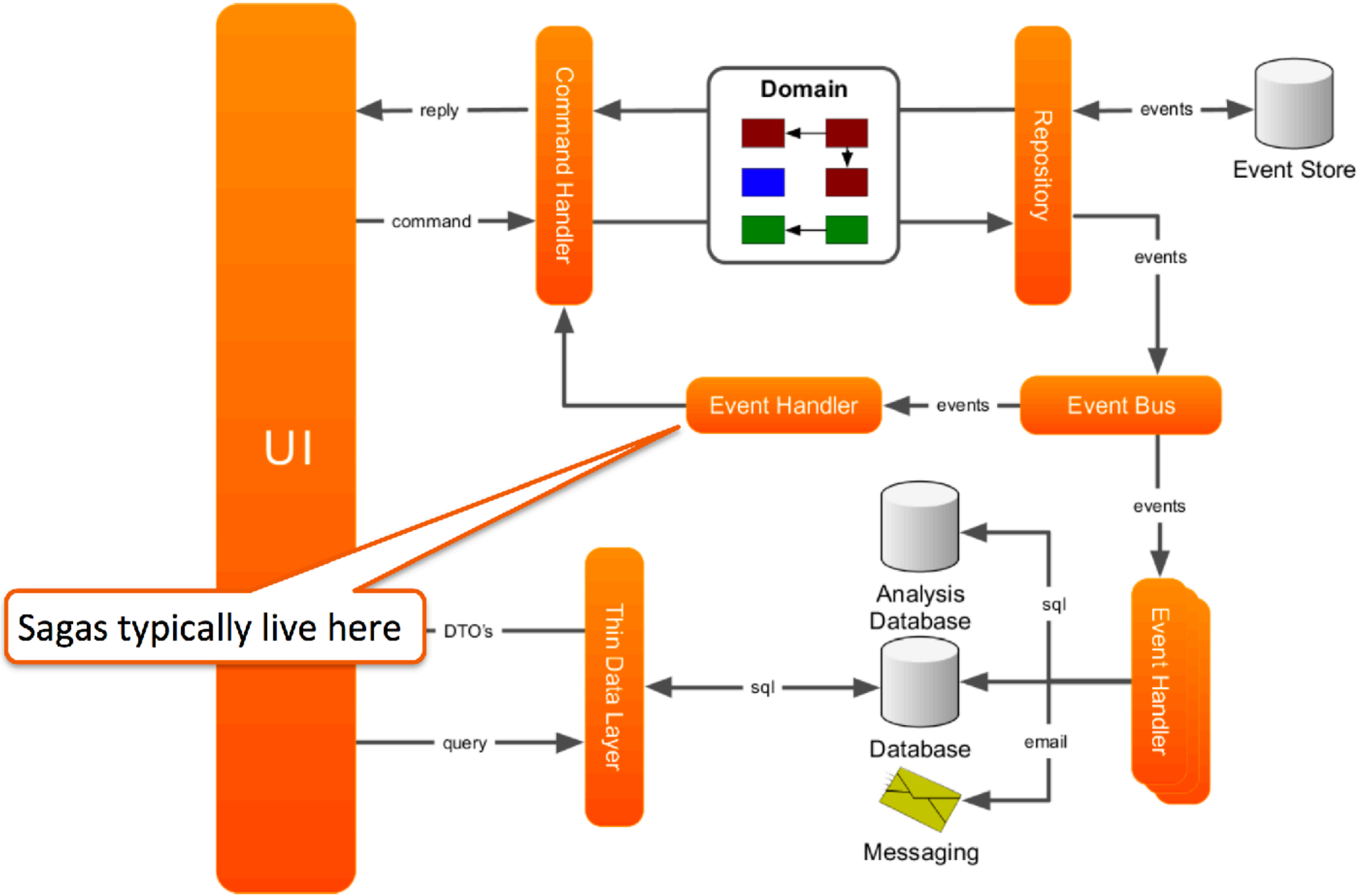
ACID?

BASE

Basic Availability, Soft state, Eventual consistency

Saga

- Use to manage BASE transactions.
- React on event
- Coordinates activities between
  - Bounded contexts
  - Aggregates


UI
reply
command
Command Handler
Domain
Repository
events
Event Store
events
Event Handler
events
Event Bus
events
Sagas typically live here
DTO's
Thin Data Layer
query
sql
Analysis Database
Database
Messaging
sql
email
Event Handler

Demo at Scale

How Can YOU Find…

Commands?

Aggregates?

Bounded Context?

DomainEvent?

Projections?

Policy?

Etc?

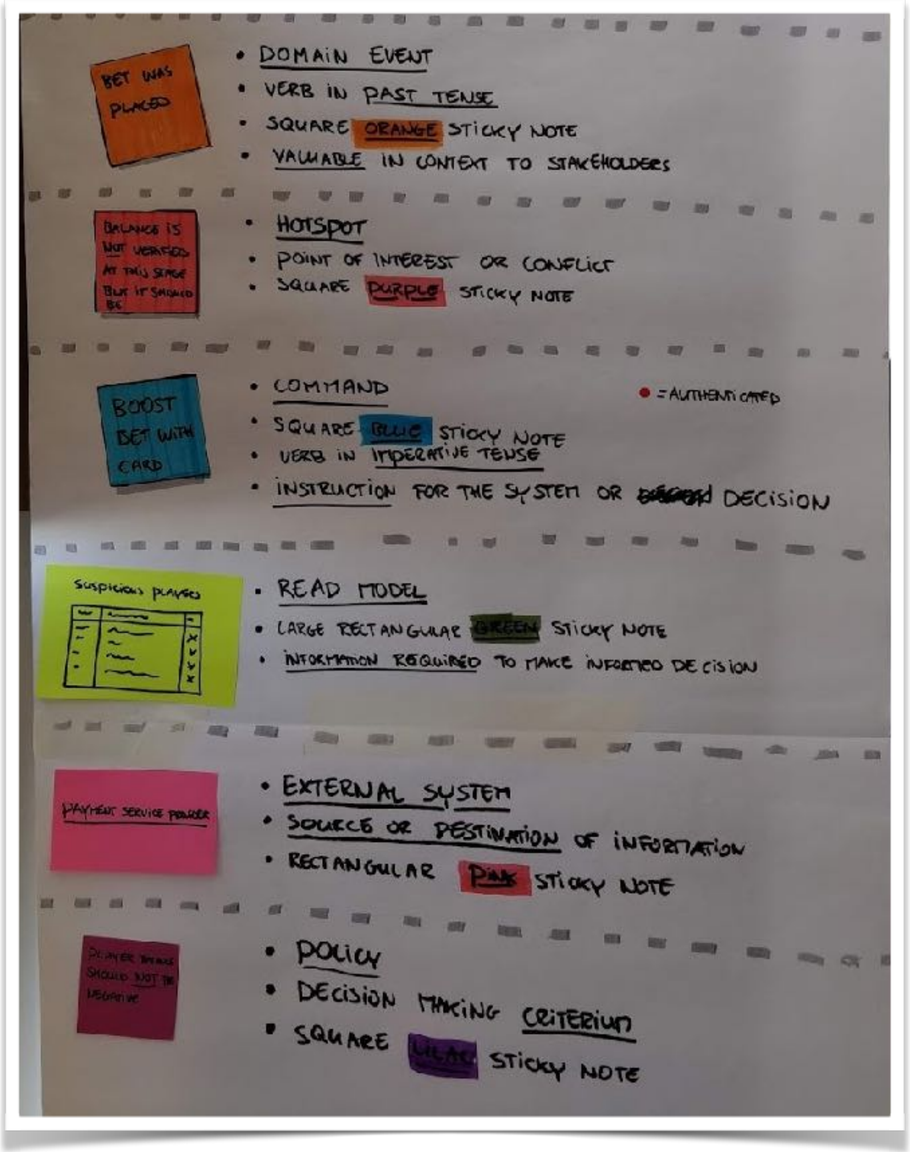
QUESTIONS
ANSWERS
QUESTIONS

EventStorming = bringing together

EventStorming ≠ Brainstorming

Event Storming, 10000 foot overview

Casumo



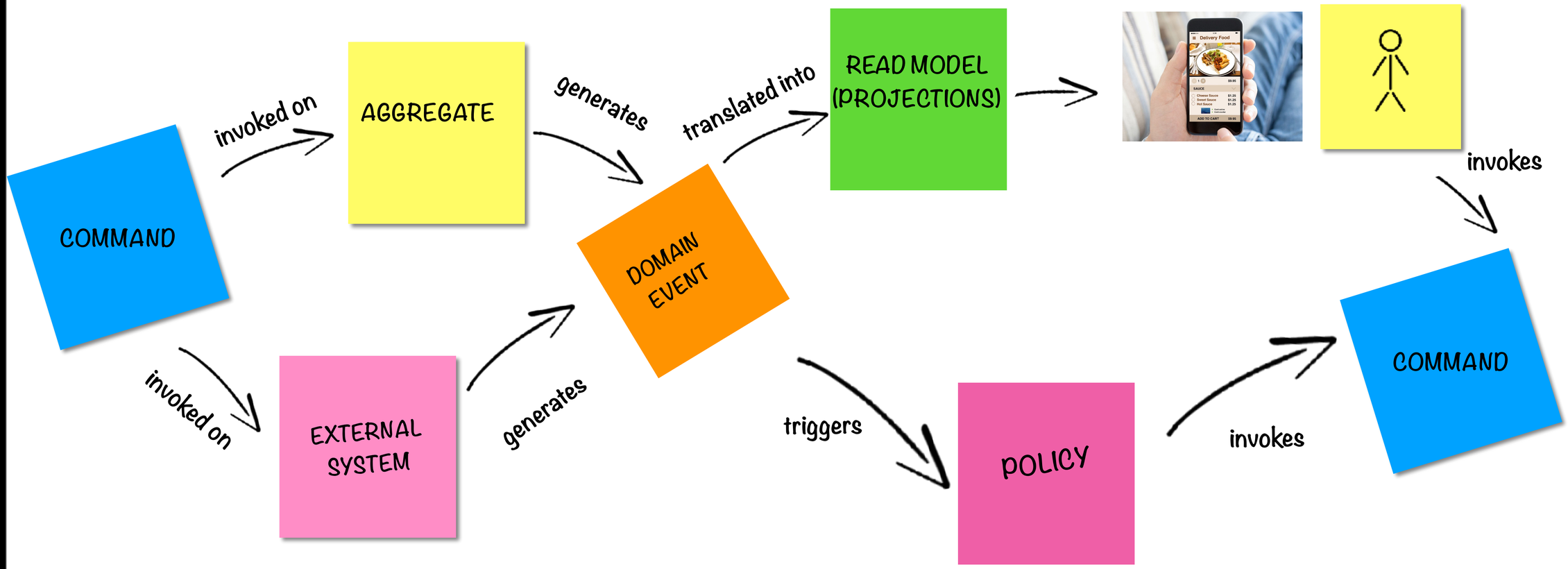
EventStorming

BIC Marking POCKET

DEVOXX™
VOXXDAYS
BRISTOL
ORACLE
#bjps

CARD
BONUS WAS
RECEIVED

Final Result == Engineering Input



Summary

- Domain first, technology later.
- DDD != perfection.
- CQRS + Event sourcing = ❤️
- Axon, theory to practise
- Event Storming == collective learning
- Learning & connecting dots

Thank You
Q&A

https://github.com/nklmish/axon-casino

http://tiny.cc/lsauuy

Feedback