codecentric

Hexagonal Frontend Architecture

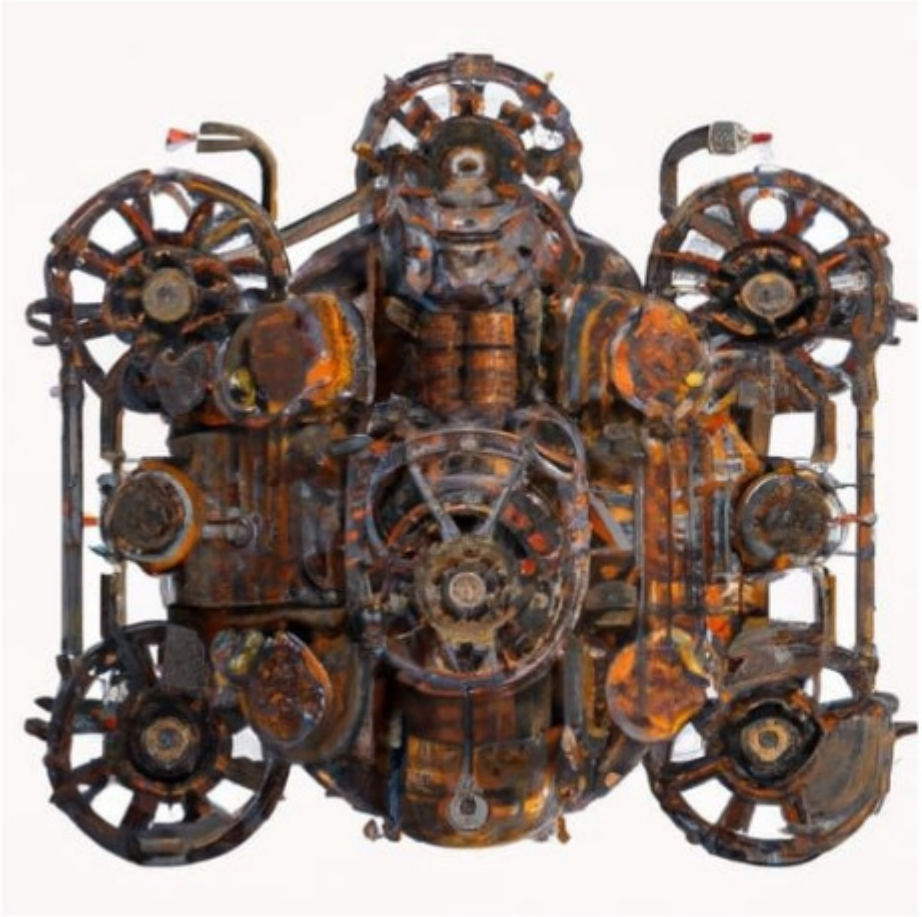
Sophia Cook
Marco Emrich


History


Architecture
& Design


early 90s
WWW

Wild Wild West



The Problem

Dependencies

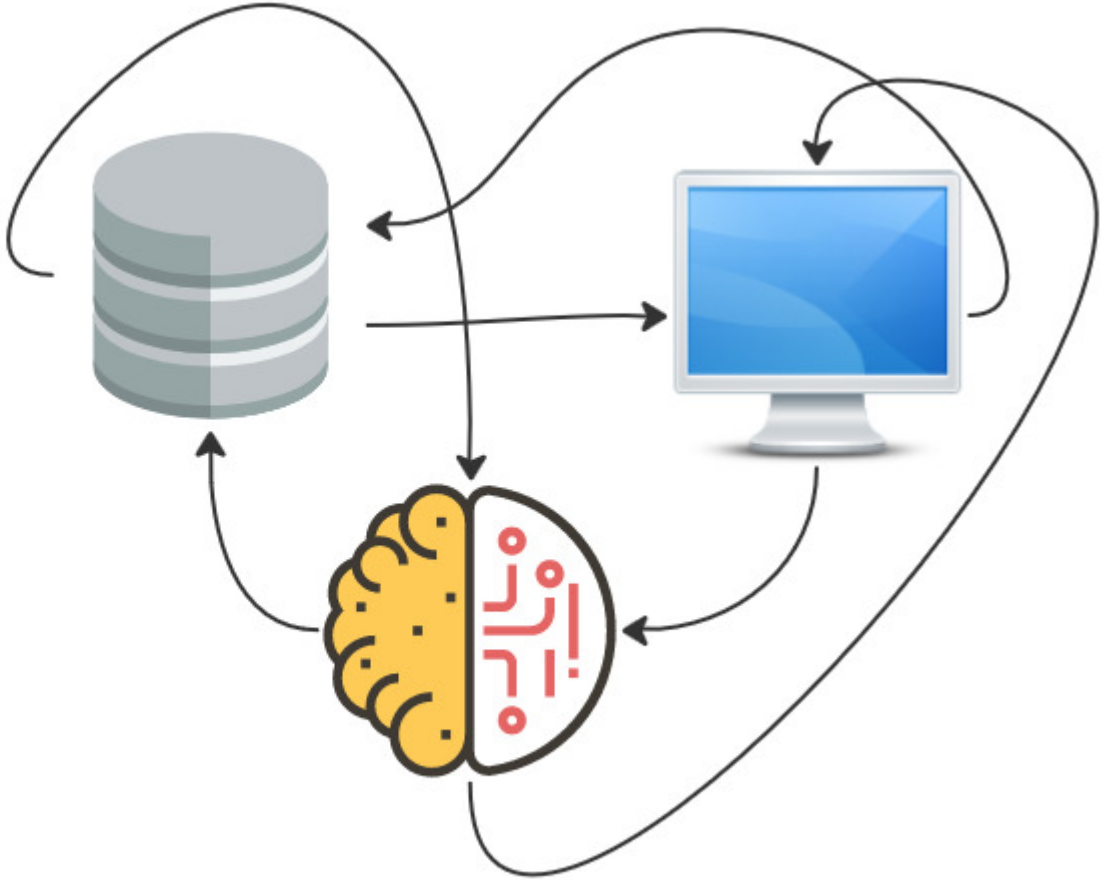

Testable
Driveable
Multi-Env
NOT


Dependencies

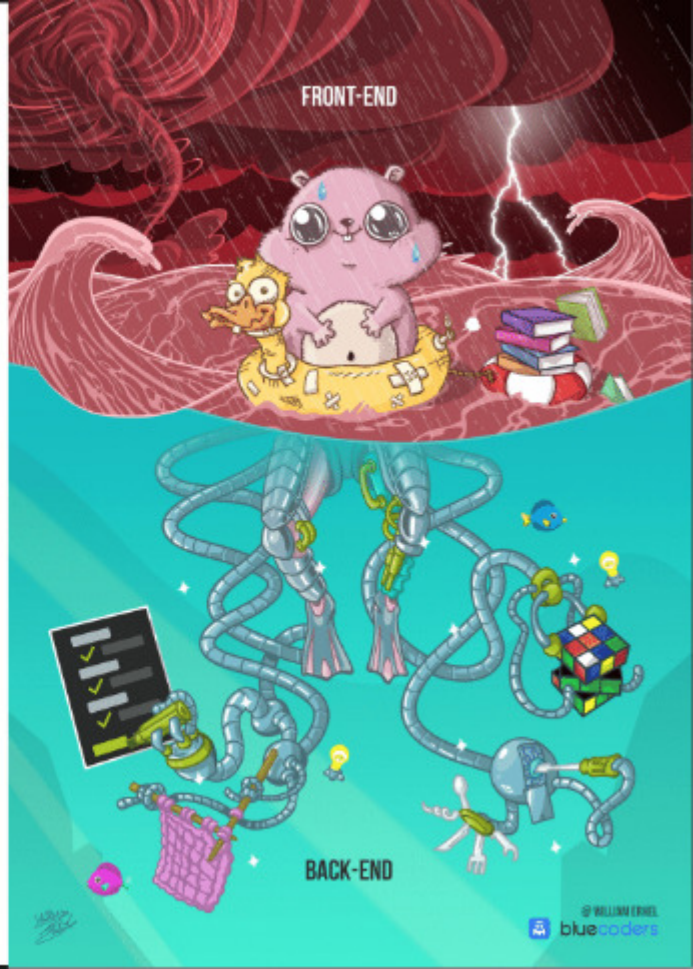

Worst
Architecture?

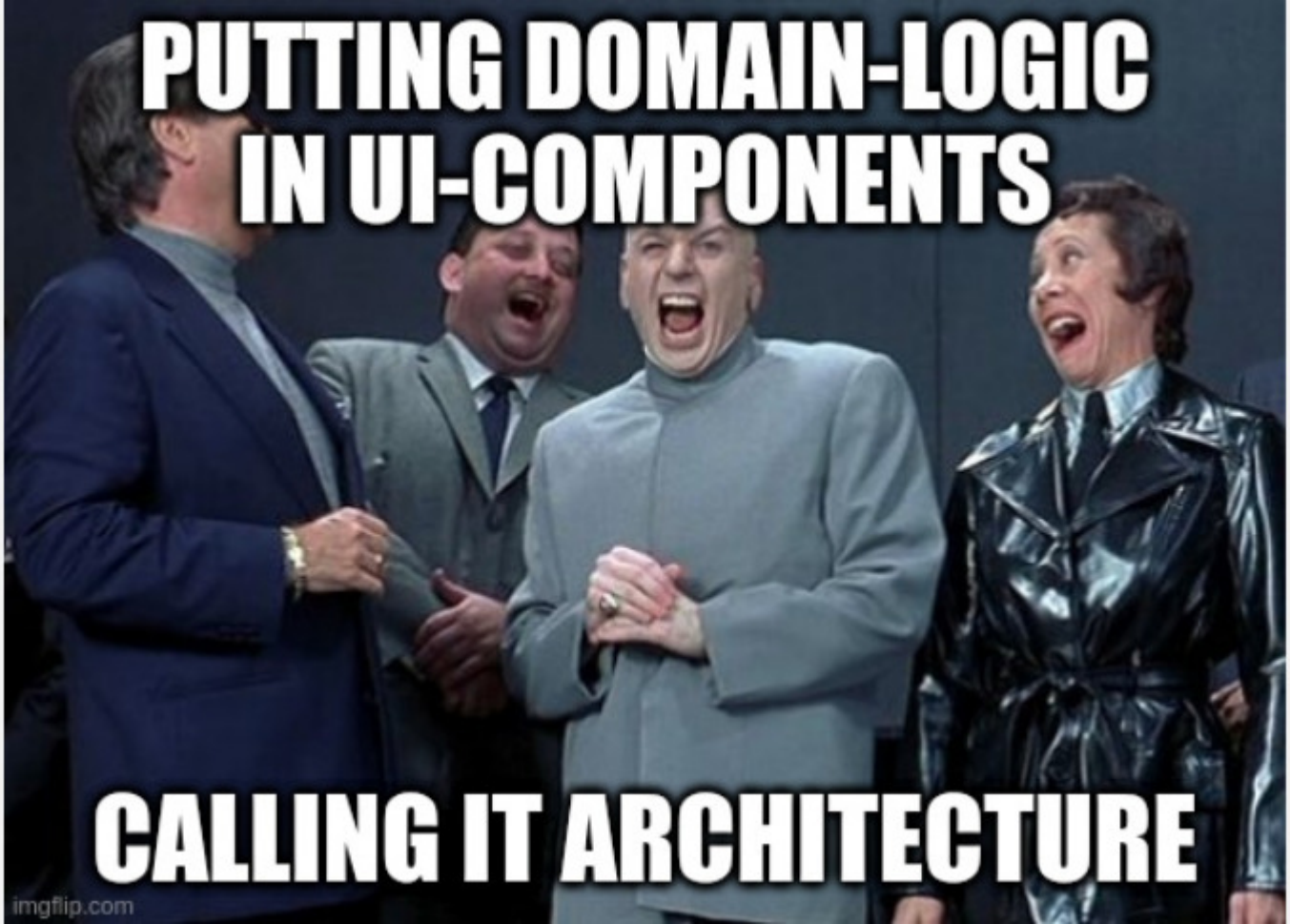
Big Ball of Mud

Big Ball of Mud



Frontend




PUTTING DOMAIN-LOGIC
IN UI-COMPONENTS
CALLING IT ARCHITECTURE
imgflip.com

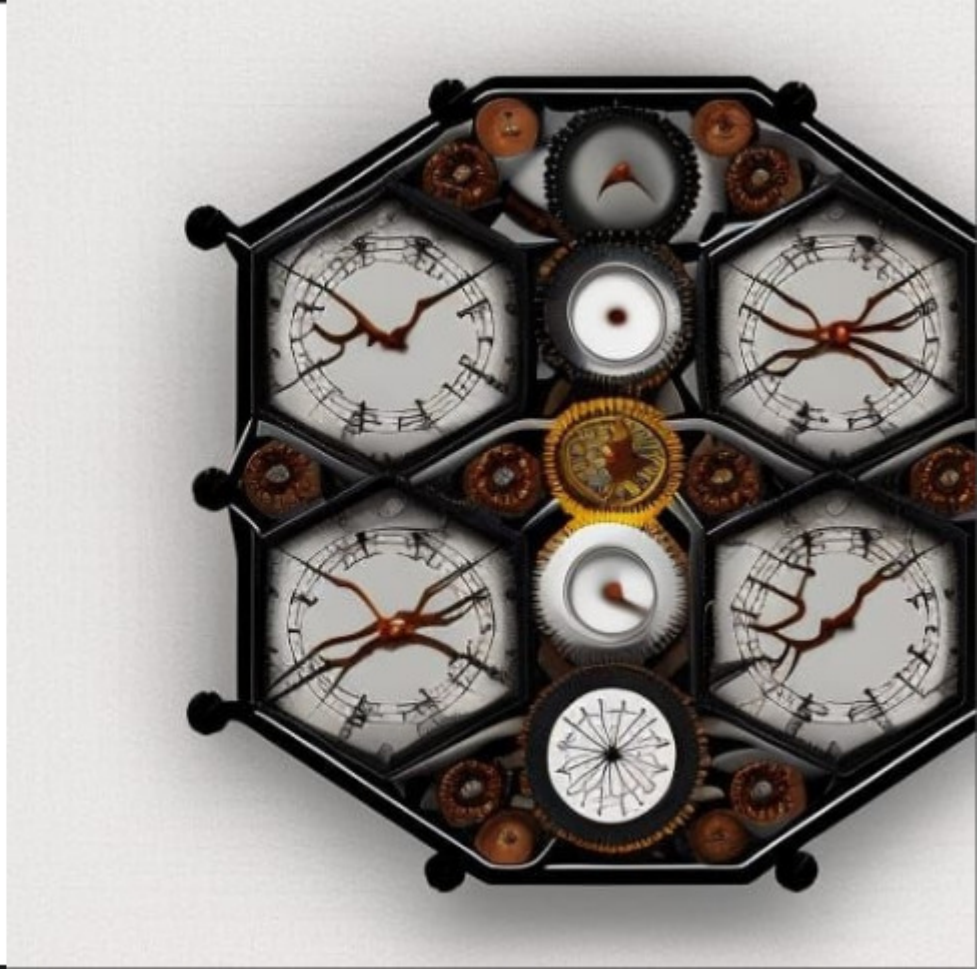

Data Fishing

```
export type ShipInYard = {
  "id": string,
    "credit": number,
    "fuelType": string,
    "image": string,
    "mileage": ? {
      "value": number,
      "unit": string
    },
    "location": {
      "name": string,
      "rotation_period": string,
      "orbital_period": string,
      "diameter": string,
      "climate": string,
      "gravity": string,
      "terrain": string,
      "surface_water": string,
      "population": string
    },
    "modelId": string,
    "vehicleCondition": string,
    "constructionYear": number
  };
export type ShipFromCatalogue = {
  "id": string
  "name": string,
  "model": string,
  "image": string,
  "manufacturer": string,
  "armaments":
    {
      "name": string,
      "count": number
    },
  "cost_in_credits": string,
  "length": string,
  "max_atmosphering_speed": string,
  "crew": string,
  "passengers": string,
  "cargo_capacity": string,
  "consumables": string,
  "hyperdrive_rating": string,
  "MGLT": string,
  "class": string,
  "pilots"?:
    {
      "name": string,
      "height": string,
      "mass": string,
      "hair_color": string,
      "skin_color": string,
      "eye_color": string,
      "birth_year": string,
      "gender": string
    },
  "films"?:
    {
      "title": string,
      "episode_id": number,
      "opening_crawl": string,
      "director": string,
      "producer": string,
      "release_date": string
    },
  "created": string
  "edited": string
};
```

Mapping

```
SpaceShip = {
  id: string;
  name: string;
  price: number;
  location: string;
  image: string;
  mileage?: MileageInLightYears;
  speed?: number;
  constructionYear: number;
  claps?: number;
};
```

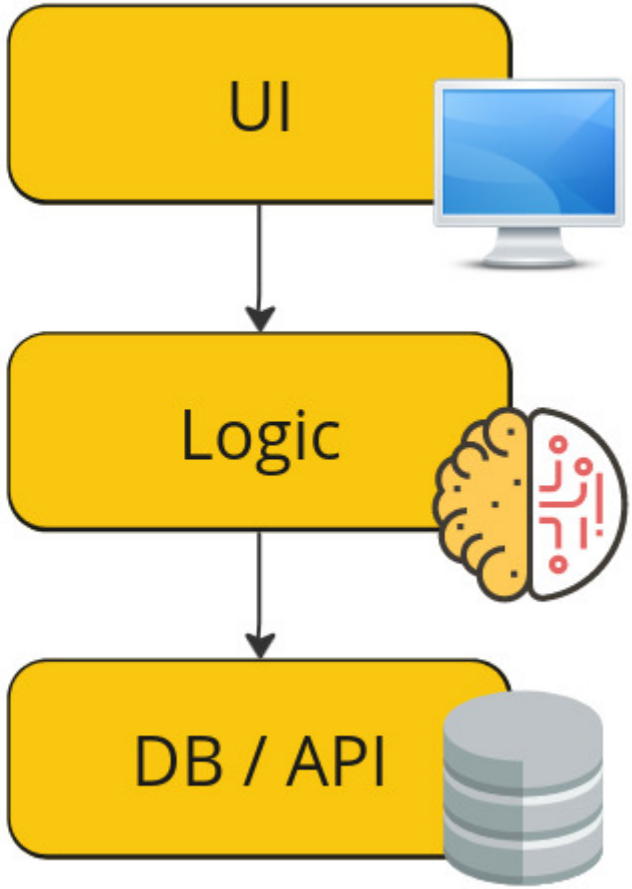
The Solution



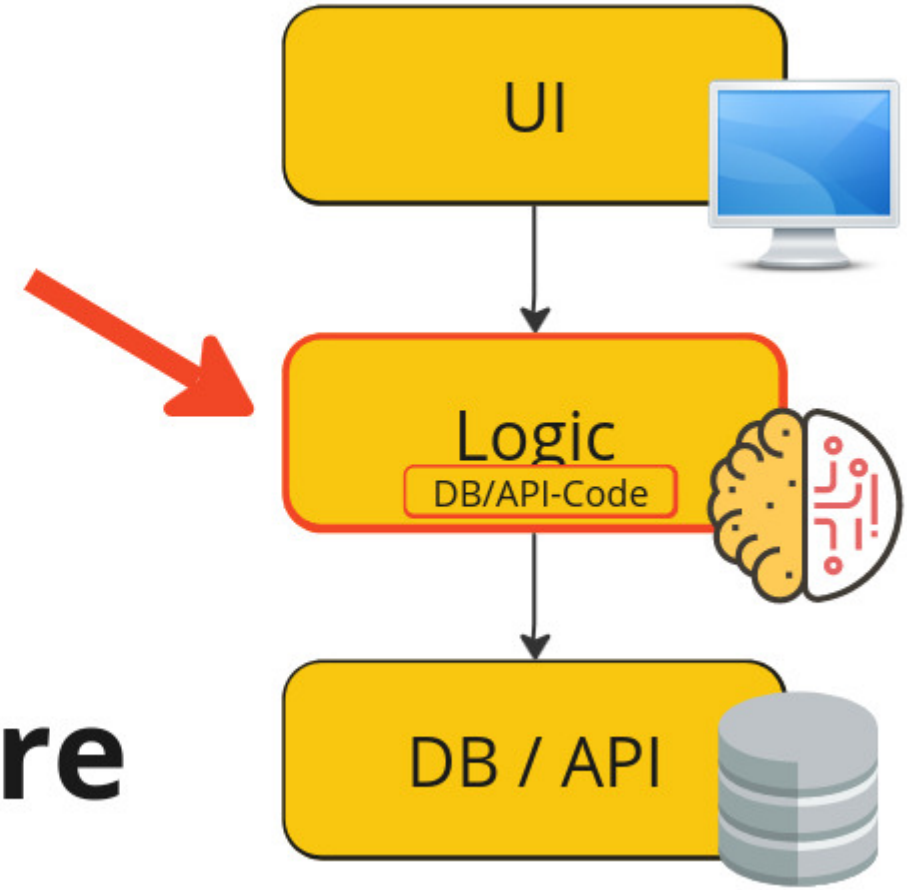

Divide &
Conquer


Separation
of Concerns

Layered Architecture



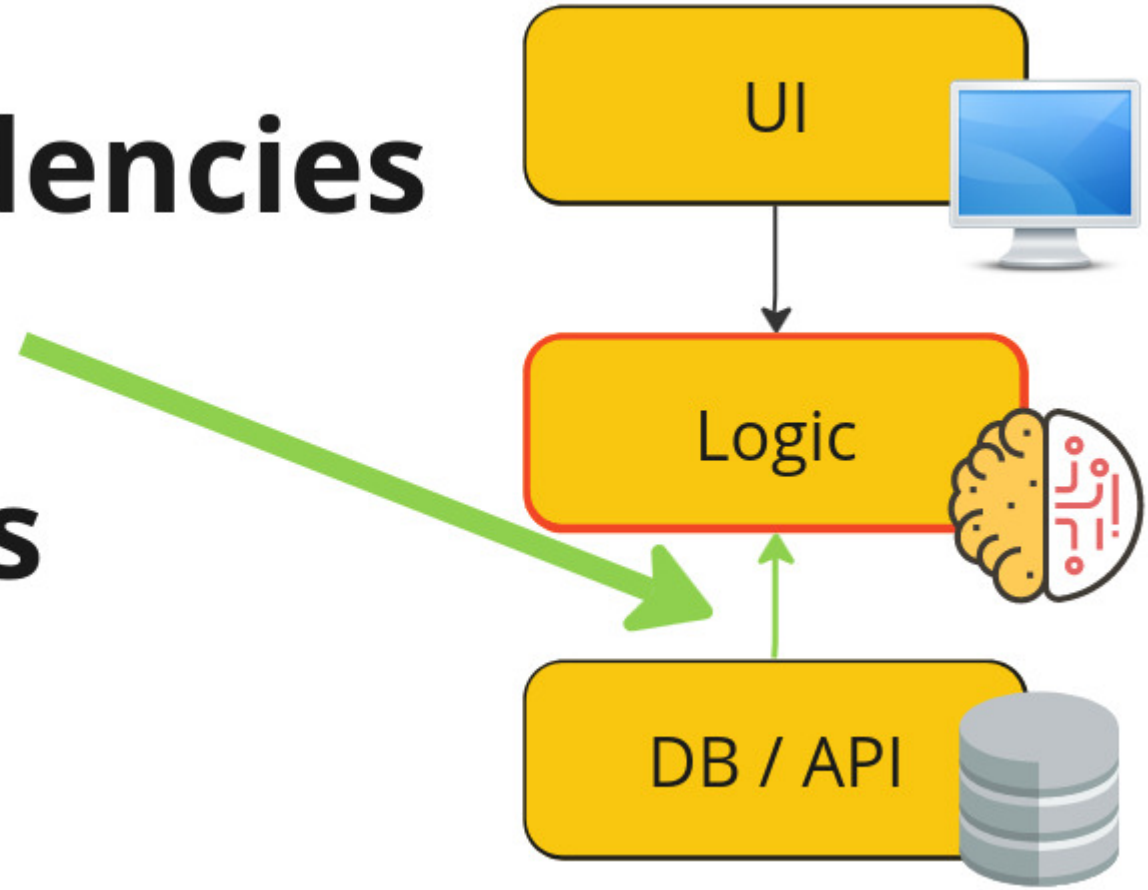
Layered Architecture



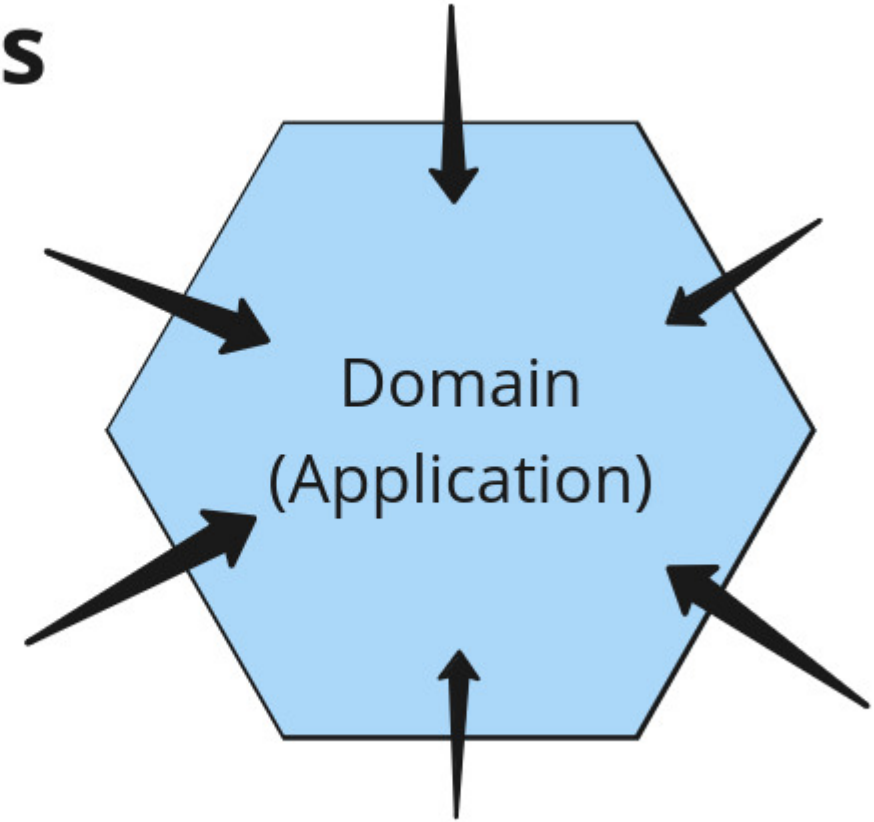
Alistair Cockburn

Original Article

Dependencies point inwards



Dependecies point inward

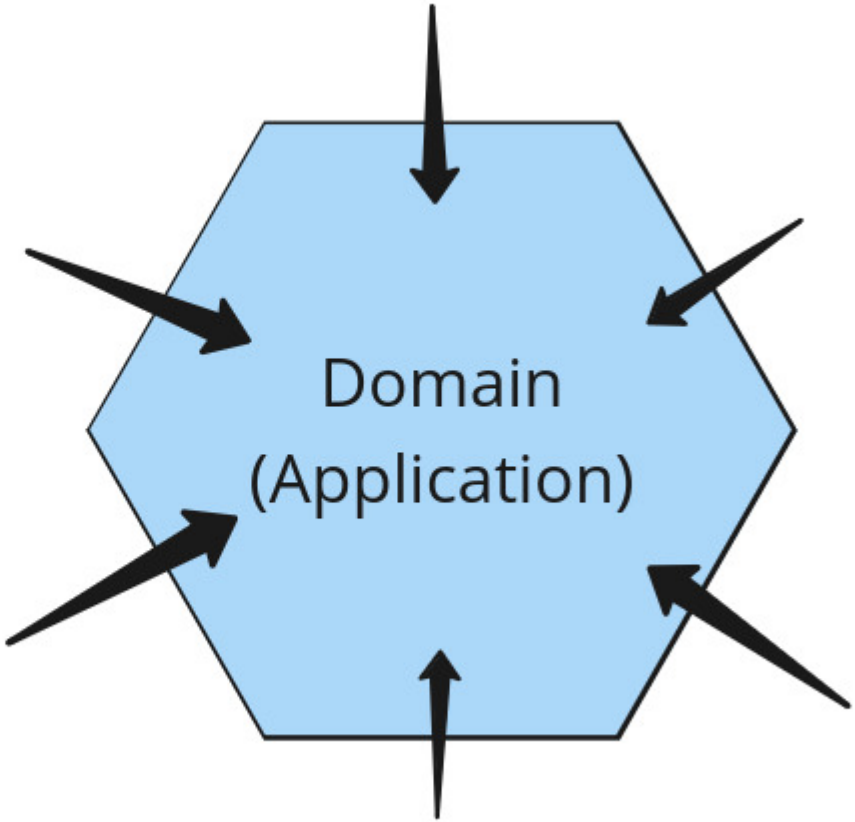


Hexagonal

aka

Ports &

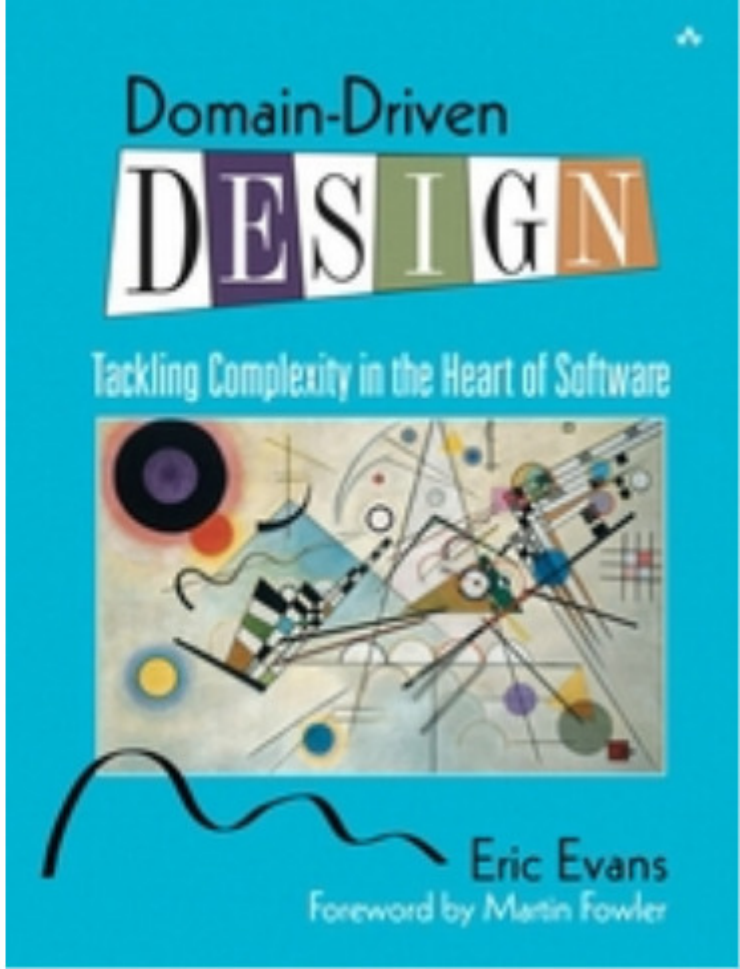
Adapters



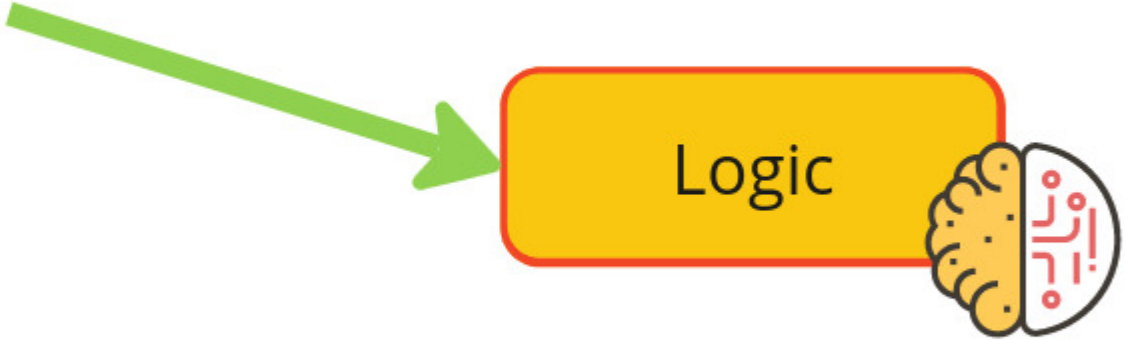
fits

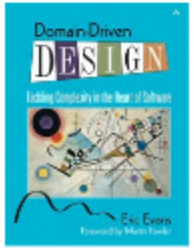
Domain Driven Design

t

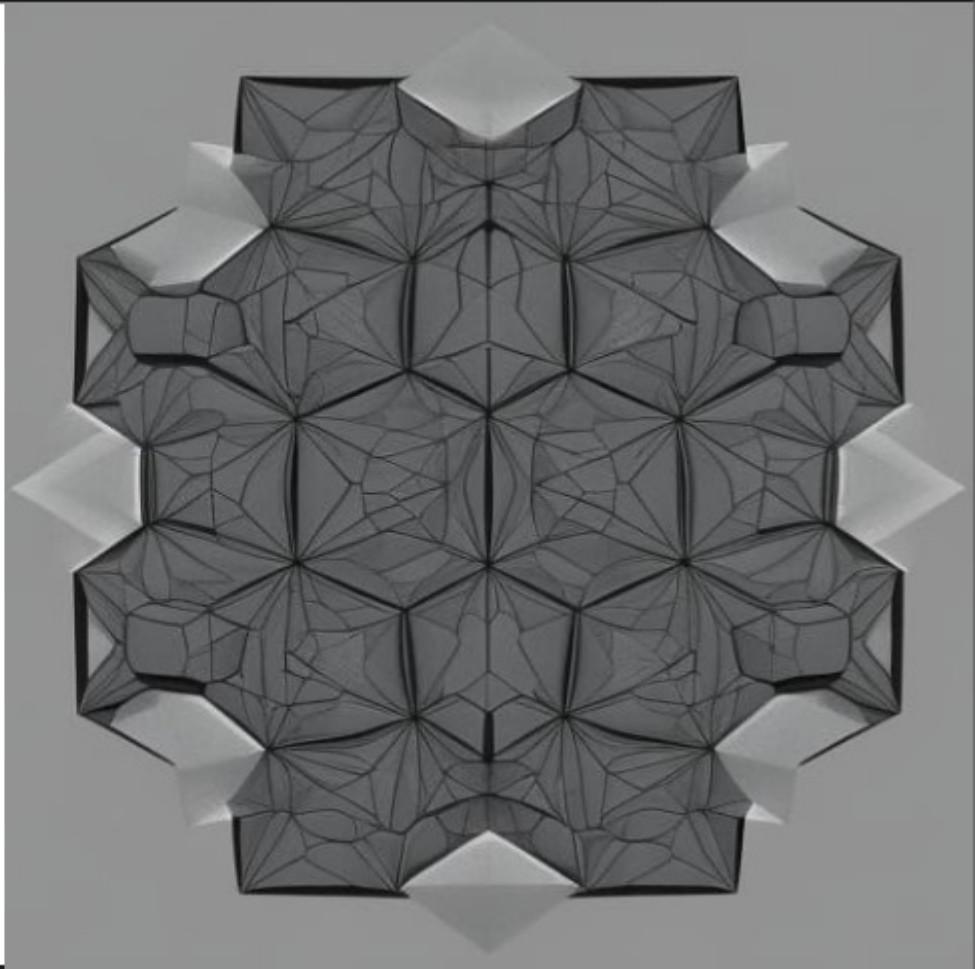


Domain Model (Pure)

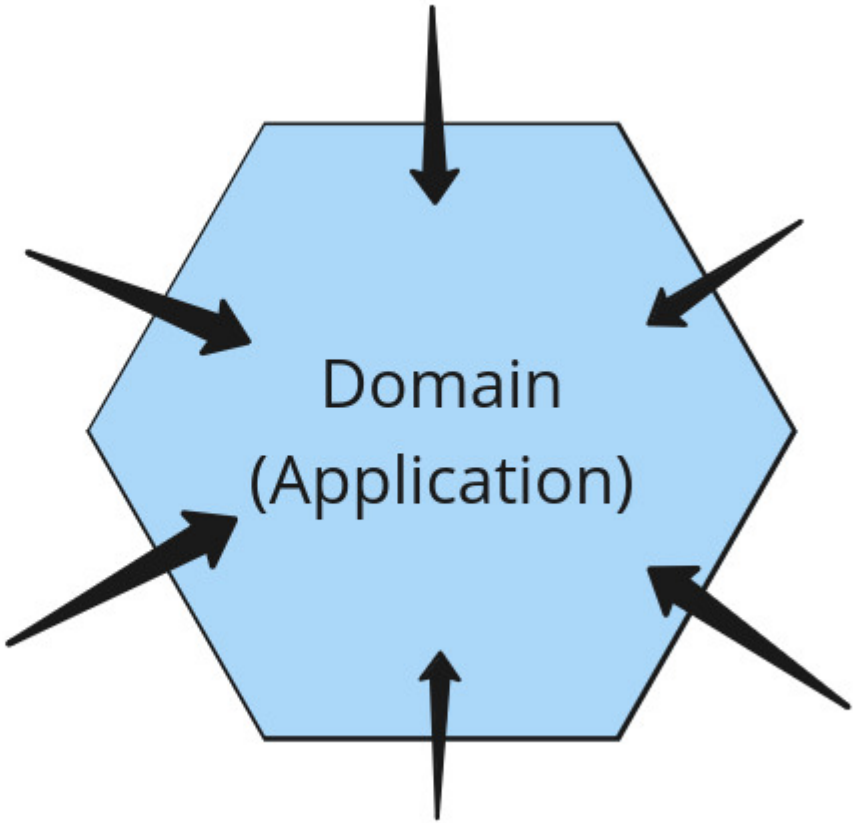


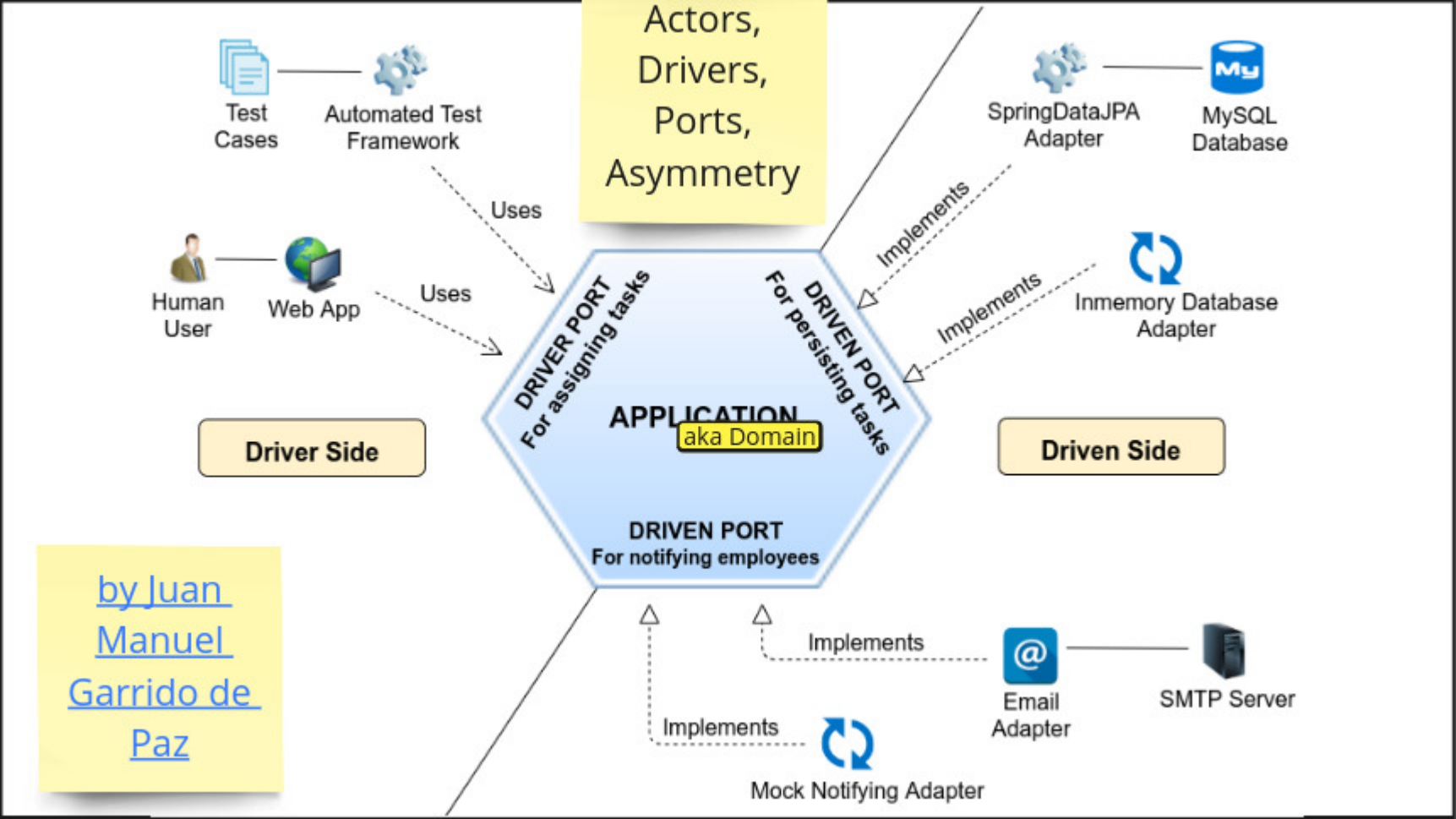


Symmetry

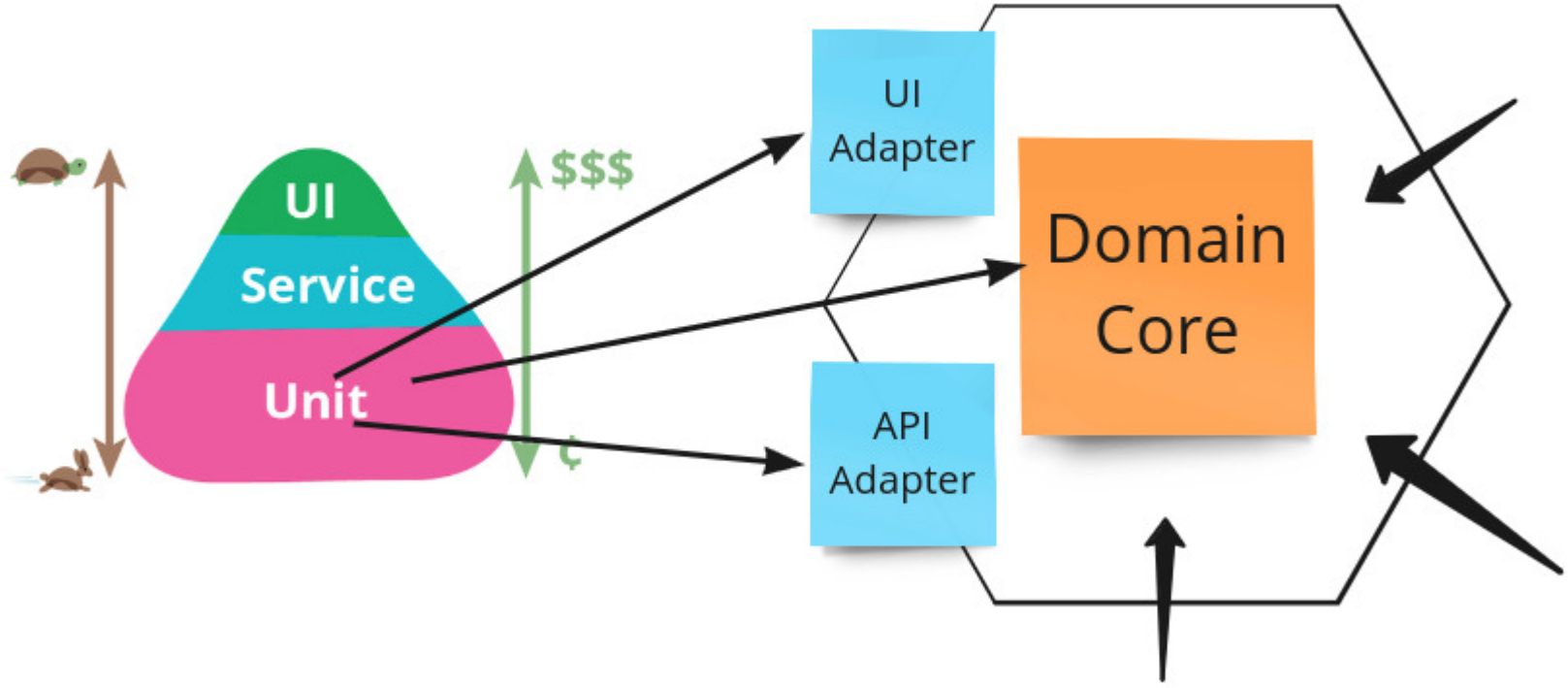


Left-Right Asymmetry



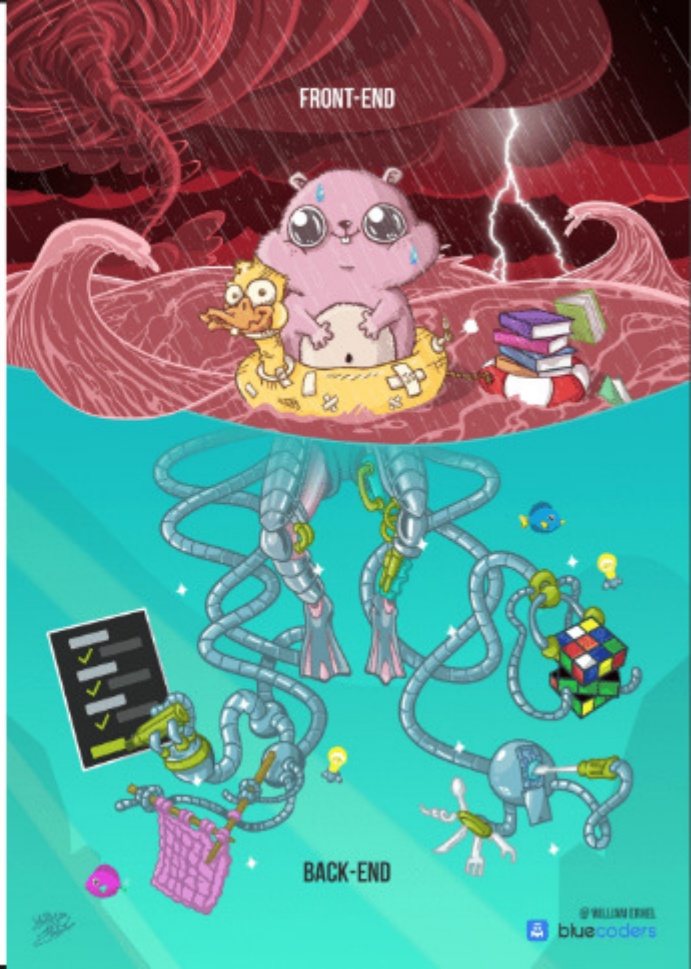

Actors, Drivers, Ports, Asymmetry
Test Cases
Automated Test Framework
Uses
Human User
Web App
Uses
DRIVER PORT
For assigning tasks
APPLICATION
aka Domain
DRIVEN PORT
For persisting tasks
DRIVEN PORT
For notifying employees
Driver Side
Driven Side
SpringDataJPA Adapter
MySQL Database
Implements
Implements
Inmemory Database Adapter
Implements
Email Adapter
SMTP Server
Implements
Mock Notifying Adapter
by Juan Manuel Garrido de Paz

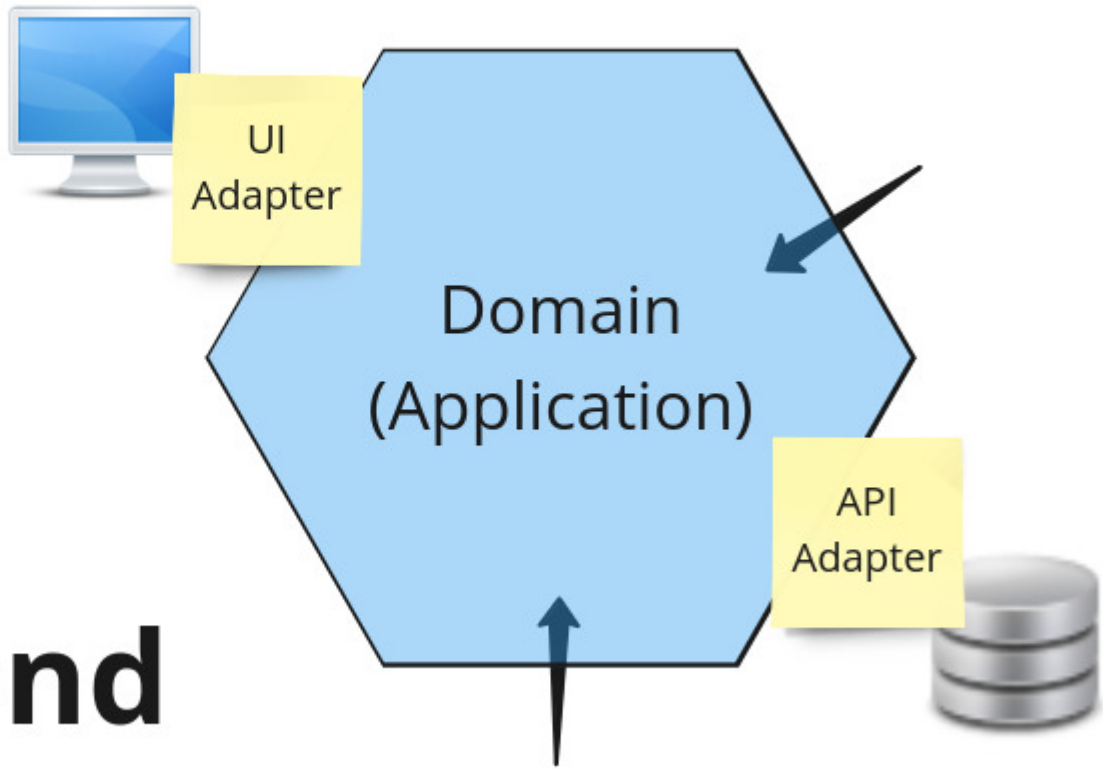
Testing


UI
Service
Unit
$$$
UI
Adapter
API
Adapter
Domain
Core

Frontend

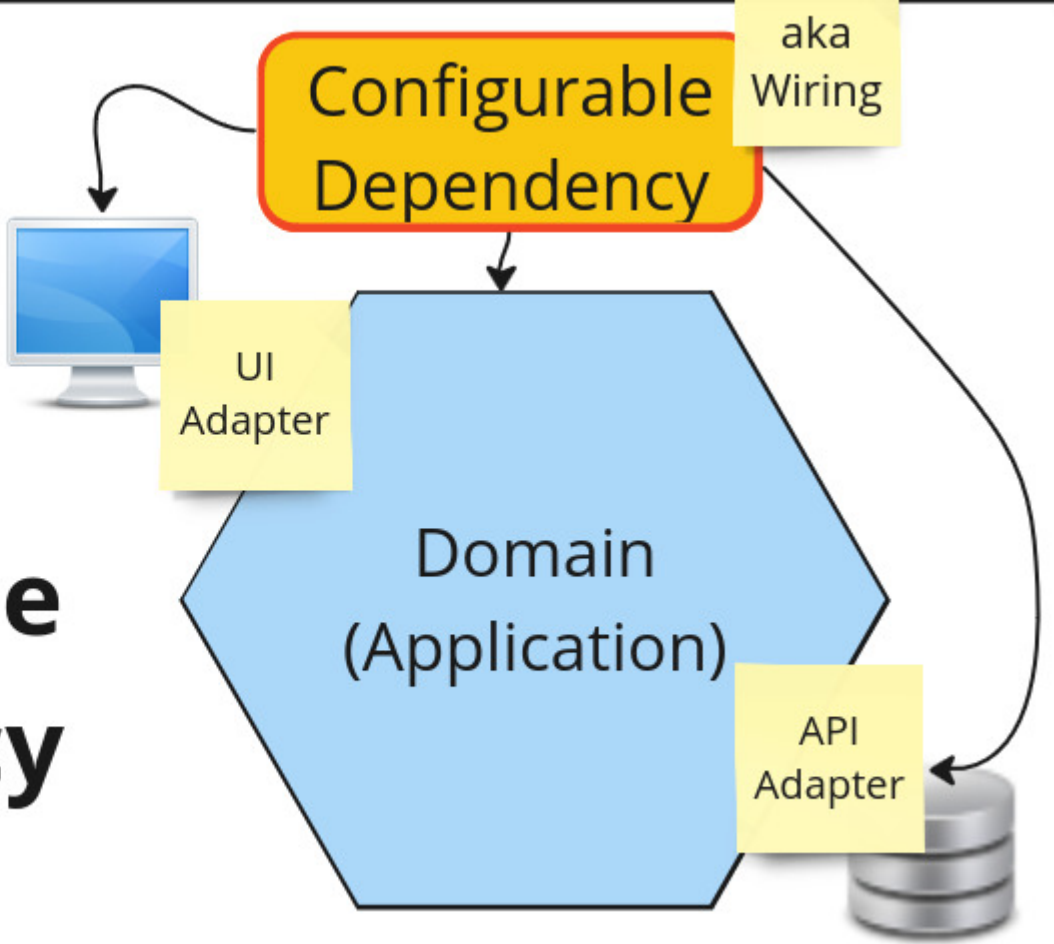
FE should not look like this



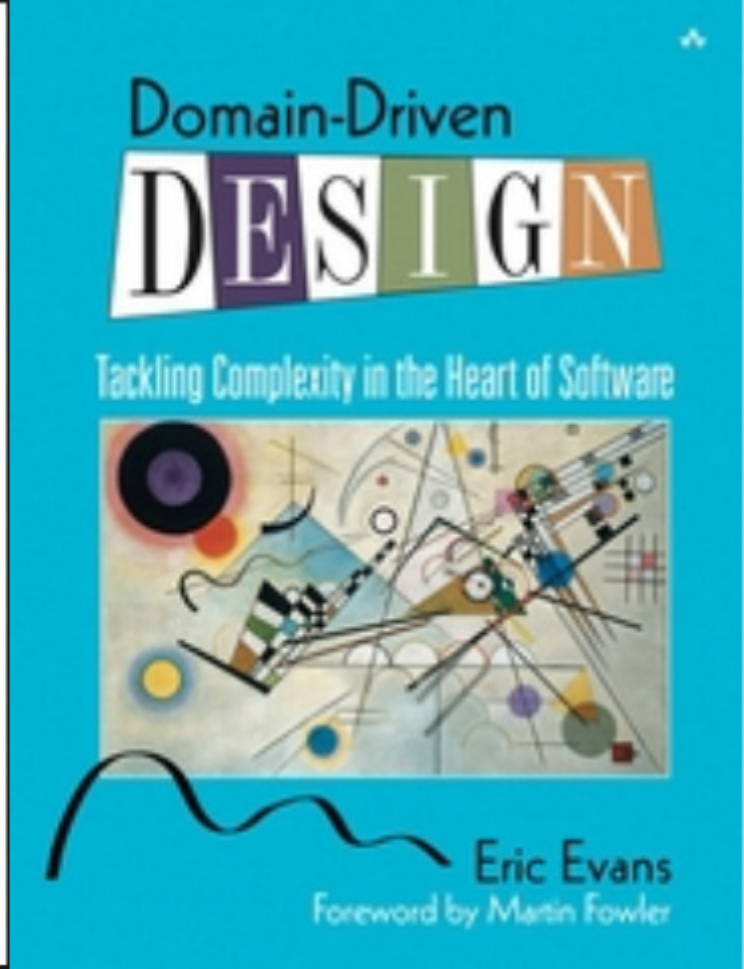


Frontend

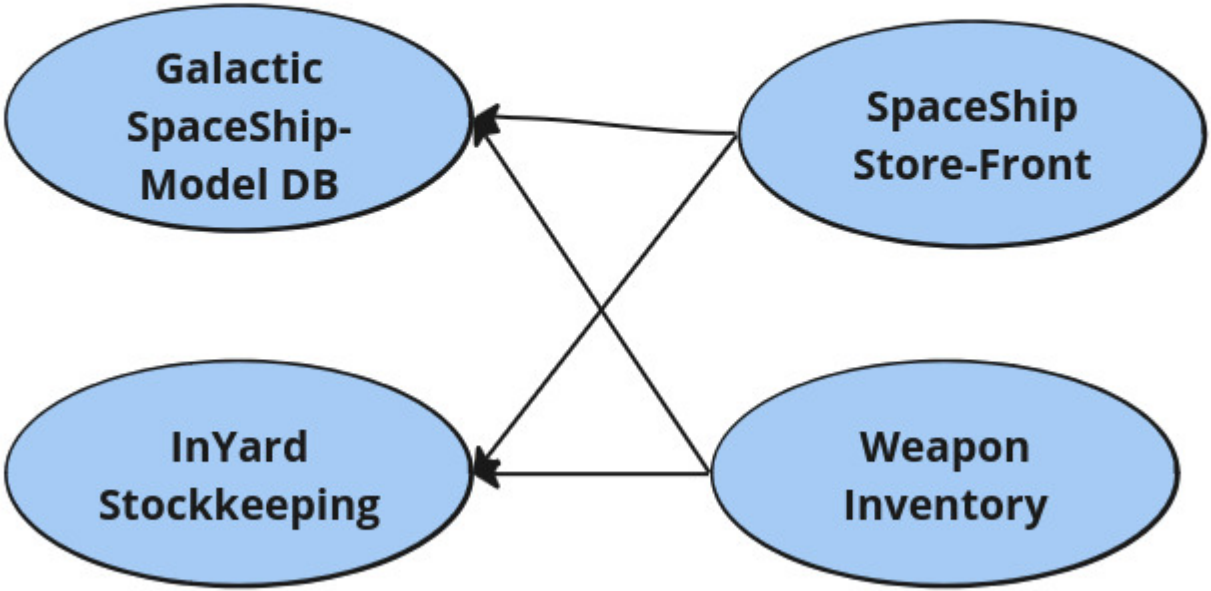
Configurable Dependency Pattern



Bounded Context



Context Map

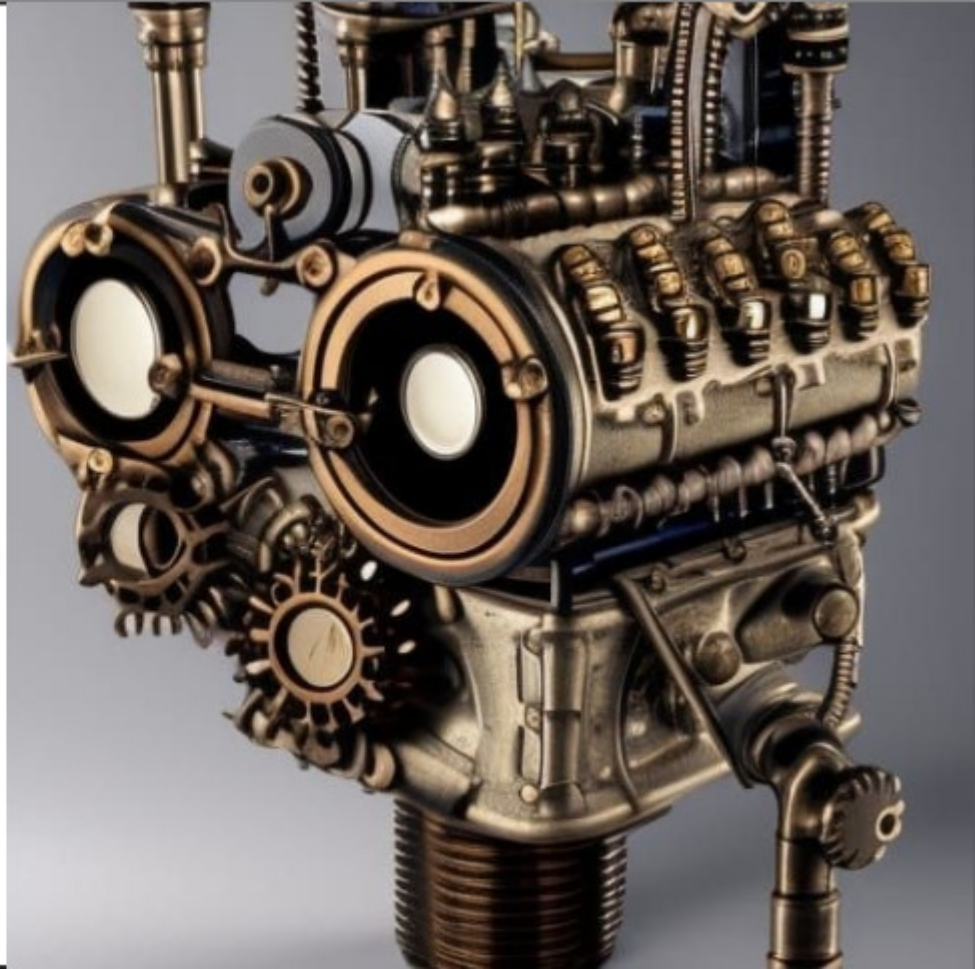

Galactic SpaceShip-Model DB
SpaceShip Store-Front
InYard Stockkeeping
Weapon Inventory

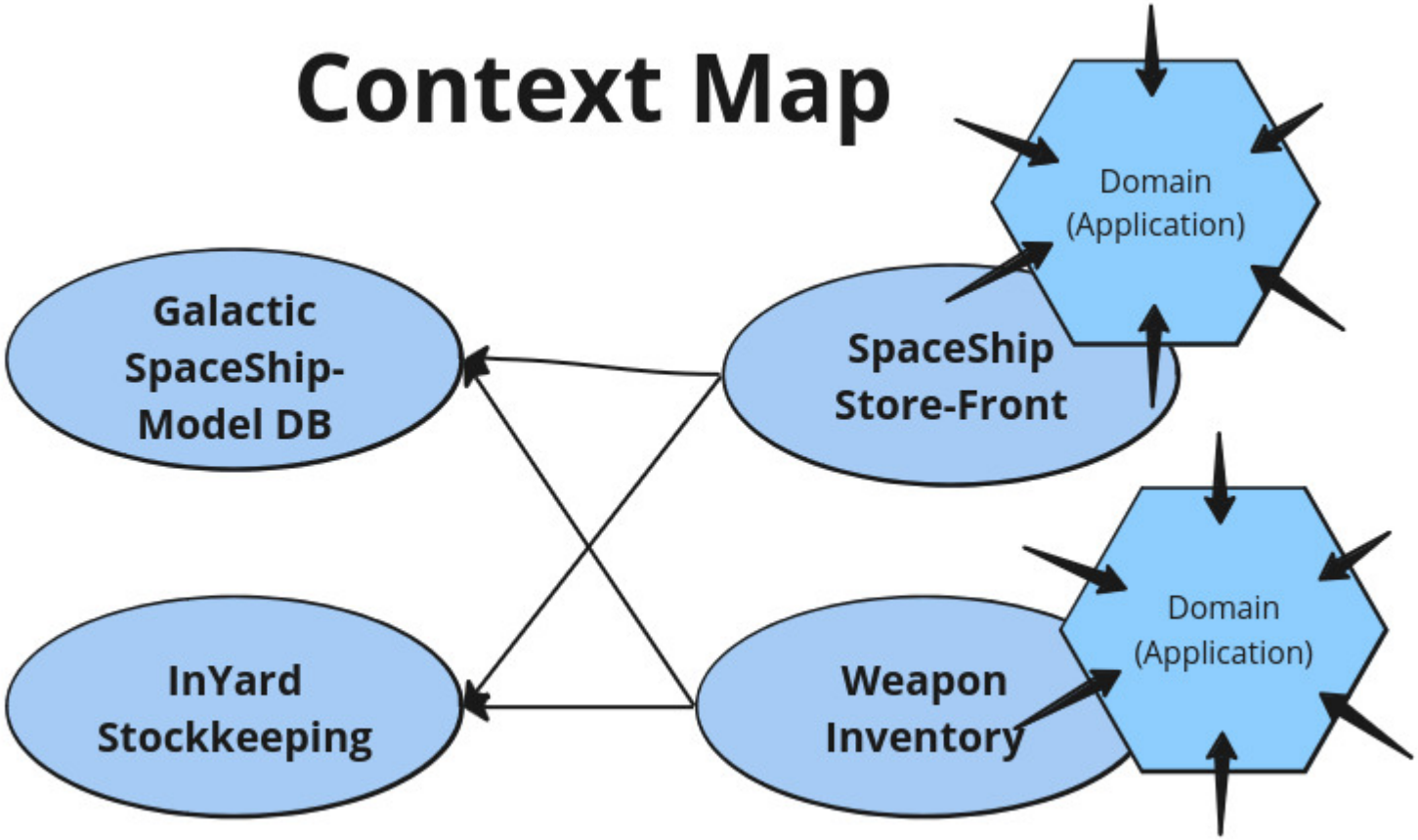
```
SpaceShip = {
  id: string;
  name: string;
  price: number;
  location: string;
  image: string;
  mileage?: MileageInLightYears;
  speed?: number;
  constructionYear: number;
  claps?: number;
};
```

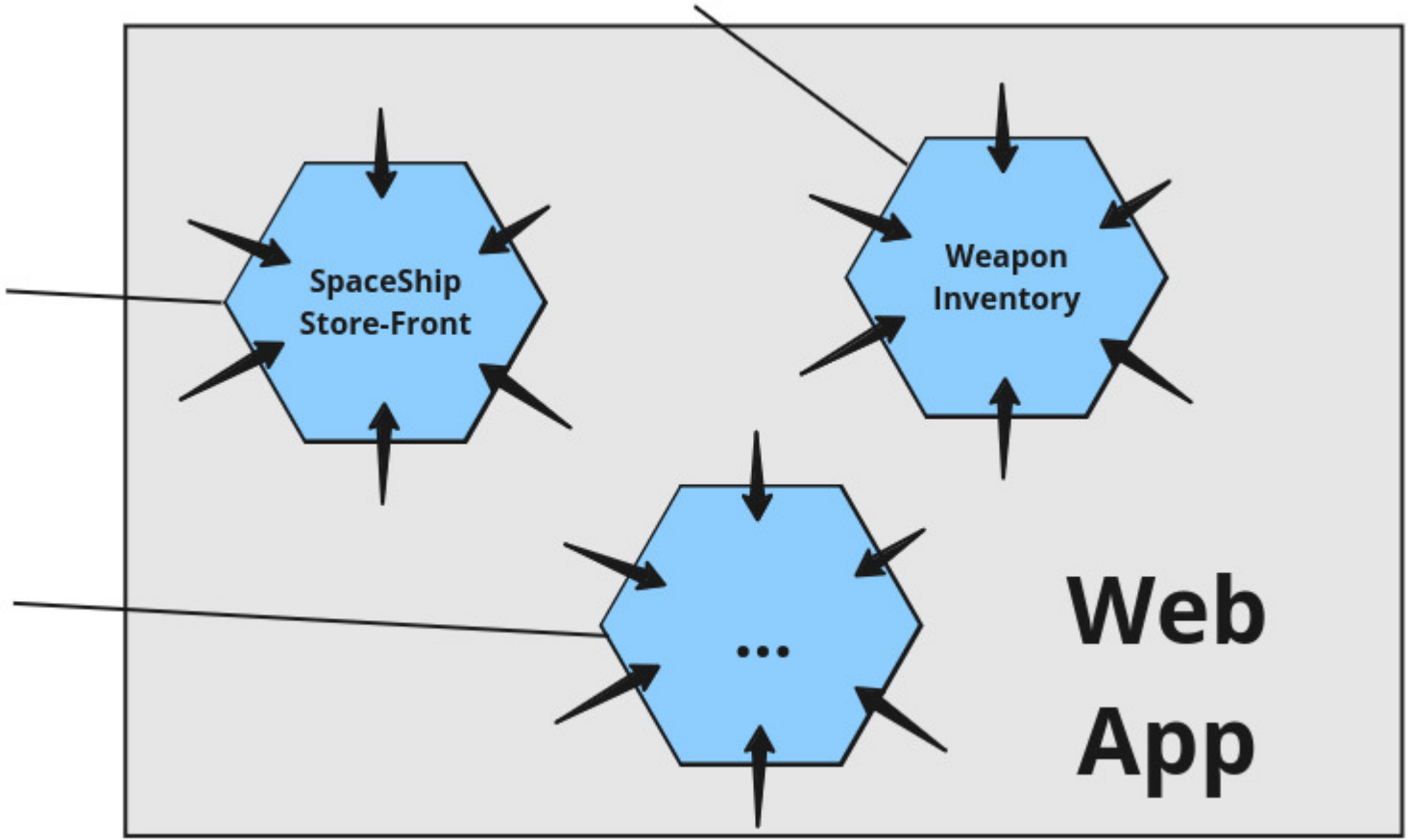
```
SpaceShip = {
 name: string,
  image: string,
 weapons: Weapon[]
}
```

```
SpaceShip = {
...
}
```

Reduce Complexity




Context Map
Domain
(Application)
Galactic
SpaceShip-
Model DB
SpaceShip
Store-Front
Domain
(Application)
InYard
Stockkeeping
Weapon
Inventory


SpaceShip
Store-Front
Weapon
Inventory
...
Web
App

Bottom Line


BROUWERIJ ACHOUFFE 6666
BAR 66
66 ZONNETJE IN JE GLAS
♡ de babbel ♡
1599 CHOUFFE ALTIJD GOED GEMUIST!
FRUITIG CHERRY 1256
MM LA CHOUFFE!
♡ the beach ♡
CHOUFFE ME IF YOU CAN

Trade-Offs

- clear separation
- easy to test (less Mocks)
- easy to maintain
- extra code needed

Does it fit?

App Size 

Life Time 

business logic in frontend 

Implementation