

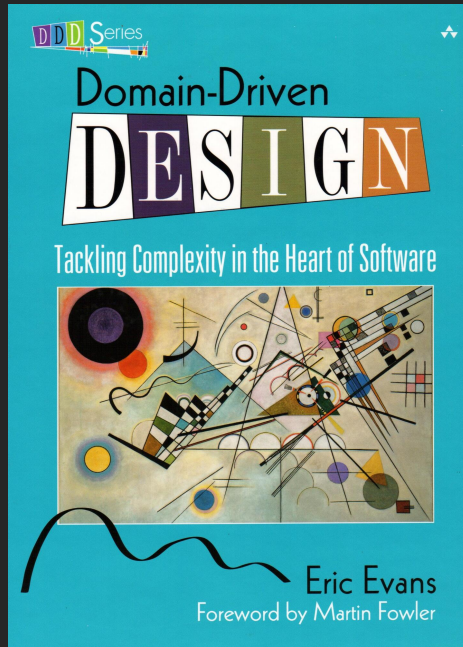
An introduction to Domain Driven Design



Rob Allen, November 2024



It started with a book



Tackling Complexity in the Heart of Software



DDD provides for the
Strategic and Tactical



A board game map with Arabic text and various colored pieces. The map features several regions with Arabic labels: 'الولايات المتحدة' (United States) in the center, 'البحر الأحمر' (Red Sea) to the east, 'غرب' (West) to the west, and 'شرق' (East) to the east. There are also labels for 'أونتاريو' (Ontario) and 'البحر الأبيض المتوسط' (Mediterranean Sea). The map is populated with numerous pieces in blue, red, yellow, and green. A compass rose is visible in the bottom left corner.

Strategic Design



Domains & Models



London's Rail & Tube services



tfl.gov.uk
nationalrail.co.uk

Key to lines and symbols

[Red Line]	London Underground District Line	[Red Line]	London Underground Piccadilly Line
[Blue Line]	London Underground Circle Line	[Blue Line]	London Underground Northern Line
[Green Line]	London Underground Metropolitan Line	[Green Line]	London Underground Victoria Line
[Orange Line]	London Underground Great Northern Line	[Orange Line]	London Underground Jubilee Line
[Purple Line]	London Underground Bakerloo Line	[Purple Line]	London Underground Crossrail 2
[Yellow Line]	London Underground Bakerloo Line	[Yellow Line]	London Underground Crossrail 2
[Black Line]	London Overground	[Black Line]	London Overground
[Light Blue Line]	National Rail	[Light Blue Line]	National Rail
[Grey Line]	London Underground	[Grey Line]	London Underground

Find your station

Station Name	Line	Direction	Frequency
St Pauls Churchyard	London Underground District Line	City	10
St Pauls Churchyard	London Underground District Line	North	10
St Pauls Churchyard	London Underground District Line	South	10
St Pauls Churchyard	London Underground District Line	West	10
St Pauls Churchyard	London Underground District Line	East	10
St Pauls Churchyard	London Underground District Line	Central	10
St Pauls Churchyard	London Underground District Line	Outer	10
St Pauls Churchyard	London Underground District Line	Inner	10

Holborn station

Piccadilly line journey times

For timetable information, including first and last train times:

- Download the TfL Go app
- Visit tfl.gov.uk/timetables
- Scan the QR code below



Trains run every 2-5 minutes in central areas and 3-10 minutes in outer areas for most of the day.
*Knowledge branch trains run at up to 20 minute intervals.

Early morning and late night trains may run less frequently.

Night Tube Service

Operates on Friday and Saturday nights between Cockfosters and Heathrow (except Heathrow Terminal 4).
Trains run approximately every 15 minutes.

[Green Line]	London Underground Metropolitan Line
[Red Line]	London Underground District Line
[Blue Line]	London Underground Circle Line
[Orange Line]	London Underground Great Northern Line
[Purple Line]	London Underground Bakerloo Line
[Yellow Line]	London Underground Bakerloo Line
[Black Line]	London Overground
[Light Blue Line]	National Rail
[Grey Line]	London Underground

A Domain is

something in the real-world



A Domain is

the subject of our project



A Domain is

understood by experts in the space



A Domain Model is

a representation of the Domain



A Domain Model is

an abstraction of reality

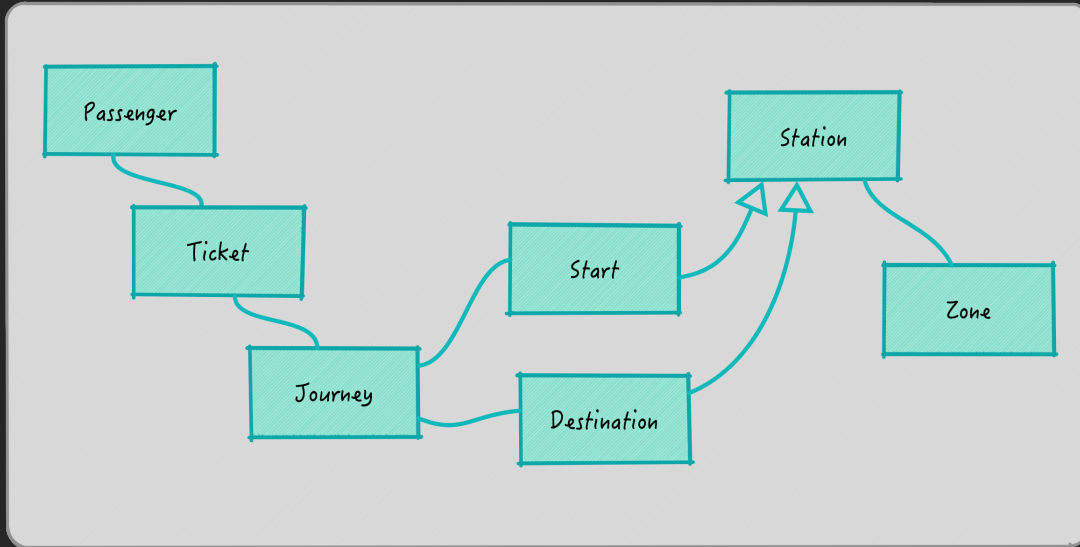


A Domain Model is

expressed as diagrams, words, code



Expressed as a diagram



Building domain knowledge

"We have really everything in common with America nowadays except, of course, language"

Oscar Wilde



Ubiquitous Language



Ubiquitous Language is

*The agreed concepts, meanings and
terms for the project*



You have to talk!



Ubiquitous Language is

*Foundational to implementing
Domain Driven Design*



In Domain-Driven Design

*Everything revolves around
Ubiquitous Language*



Observations about creating a domain model



Focus effort
where it matters



Knowledge Crunching



Knowledge Crunching

Event Storming



Telefon

Ruf an!

Tel. klingelt

KINO-BESUCHER

Telefon

Nimm Hörer ab!

KASSEN MITARBEITER

ANRUUF ENGEGEN-GEKOMMEN

Spreche Wünsche ab!

Kundenwünsche empfangen

Halle Saalplan

SAAL PLAN STOPPEL

Saalplan gecheckt!

Wie können es auch nicht gehen!

PLAN NICHT GEFUNDEN

KEINE PLATZ GEFUNDEN

Saalplan

SUCHE PLATZ

ES AB. PLATZ GEFUNDEN

Telefon

SAAL PLATZ VOR

Telefon

STRAßE PLATZ EIN

Nea. Liste

Surfly

Nea. Liste

Telefon

Telefon

Telefon

PLATZ WECHSELN SEIN

PLATZ SUGGESTION

PLATZ WECHSELN

PLATZ WECHSELN

PLATZ WECHSELN

PLATZ WECHSELN

VERKANN PLATZ

ANRUUF BEI ME KLEINER

Son der fällen?

Knowledge Crunching

User Story Mapping



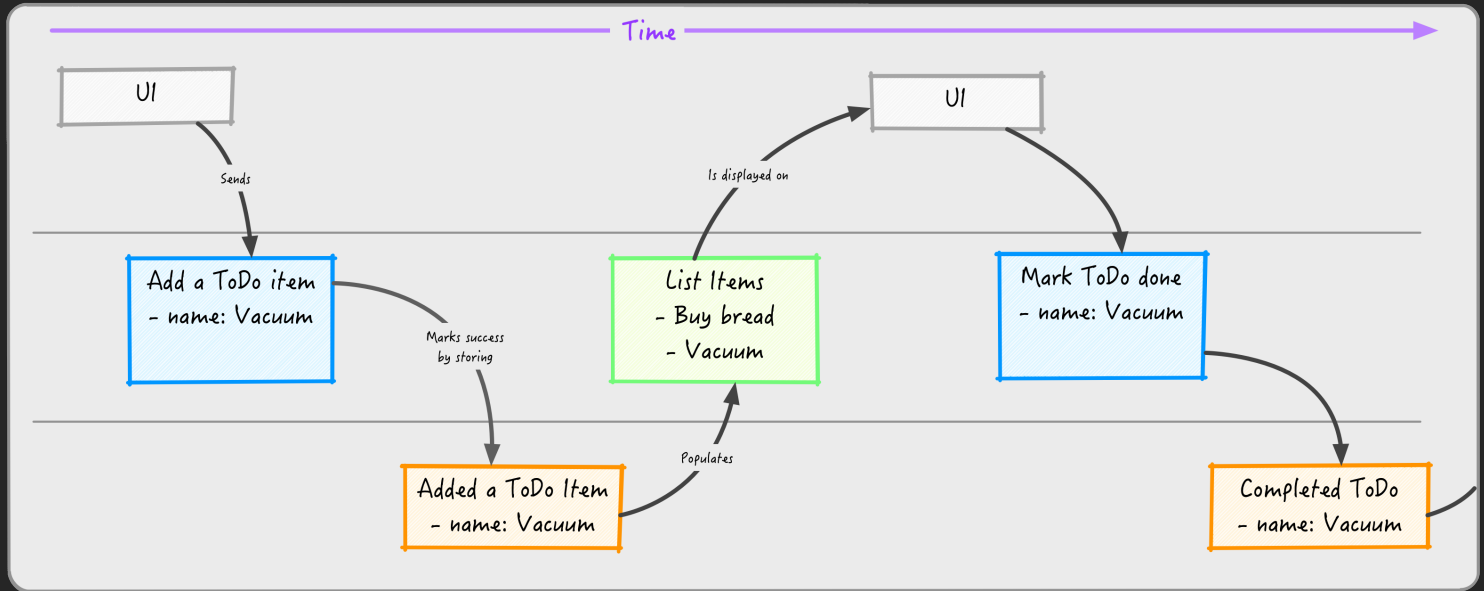


Knowledge Crunching

Event Modelling



Model change over time



Managing Domain Complexity



Bounded Contexts

define the boundary for a model



Bounded Contexts

*protect the domain model from
dilution*

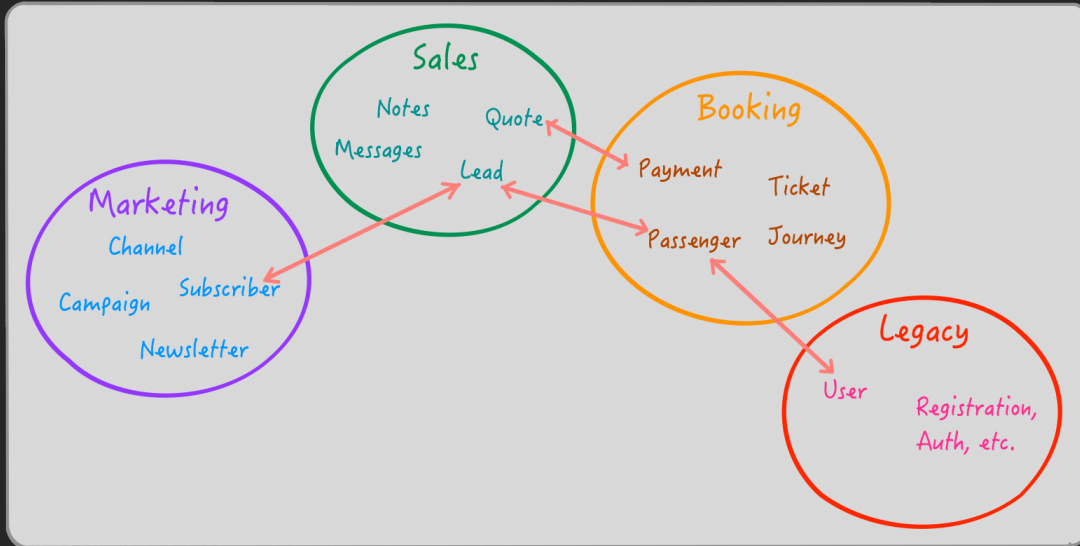


Bounded Contexts

are composed into an application



Context maps



$$R = \frac{adt}{dx}$$

$$u_{k+1} = u_k + \frac{R}{2} \{ u_k - 2u_{k-1} + u_{k-2} \} - \frac{R}{2} \{ u_k - 4u_{k-1} + u_{k-2} \}$$

$$u(k\Delta x, n\Delta t) = u_k^n$$

$$\frac{\partial u}{\partial t} dt + \frac{\partial^2 u}{\partial t^2} \frac{dt^2}{2} + \frac{\partial^3 u}{\partial t^3} \frac{dt^3}{3!} + \dots$$

$$\left\{ \frac{\partial^2 u}{\partial x^2} \frac{dx^2}{2!} \cdot 2 + \frac{\partial^3 u}{\partial x^3} \frac{dx^3}{3!} (-6) + \frac{\partial^4 u}{\partial x^4} \frac{dx^4}{4!} (12) \right\} - \frac{R}{2} \left\{ \frac{\partial u}{\partial x} (dx) 2 + \frac{\partial^2 u}{\partial x^2} \frac{dx^2}{2!} \right\}$$

$$+ \frac{\partial^4 u}{\partial x^4} \left. \right\} \implies$$

$$u_k^{n+1} - u_k^n = -R(u_{k+1}^n - u_{k-1}^n)$$

$$u_k^{n+1} = \hat{u} \exp(i\omega\Delta t + k\beta\Delta x)$$

$$2 \sin(k\omega\Delta t) = -R \frac{e^{i\beta\Delta x} - e^{-i\beta\Delta x}}{e^{i\beta\Delta x}}$$

Tactical Design

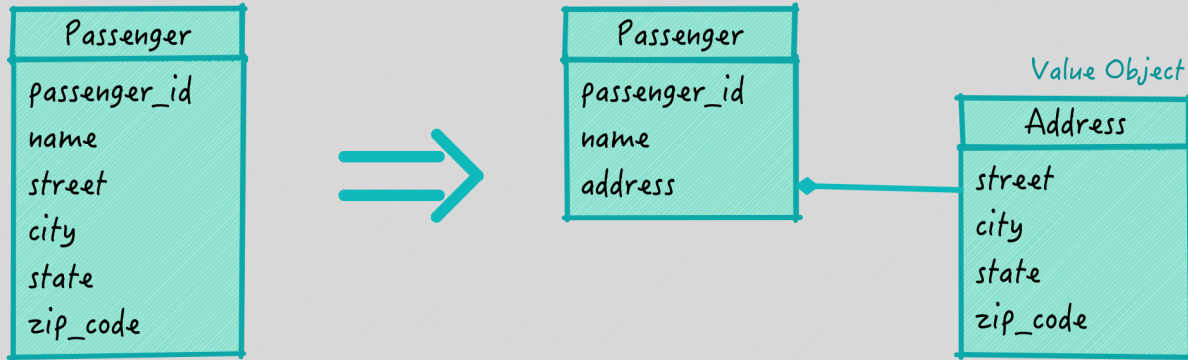


Tactical Design

*Entities, Value Objects &
Aggregates*



Entities & Value Objects



Tactical Design

Storing State

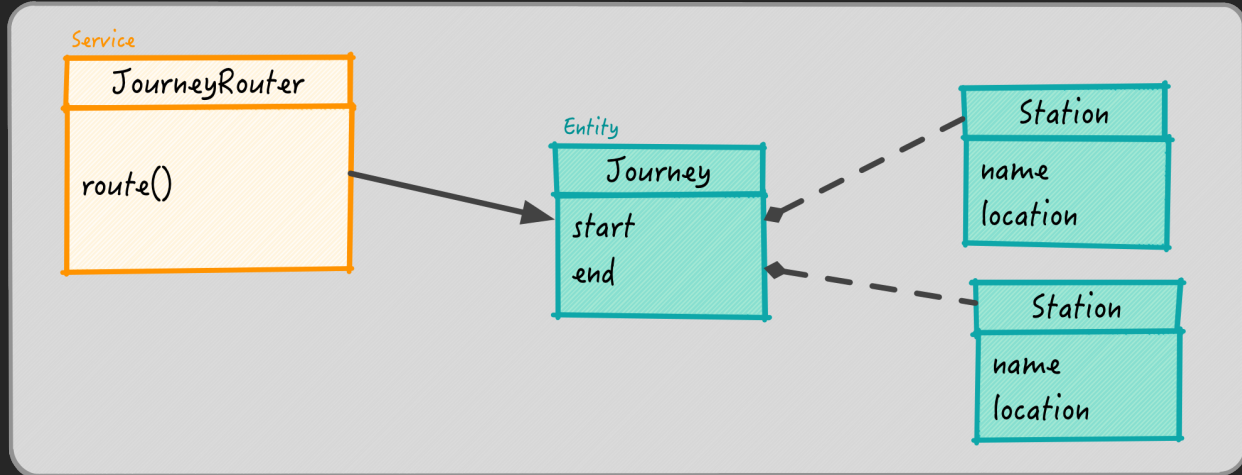


Tactical Design

Services



Services



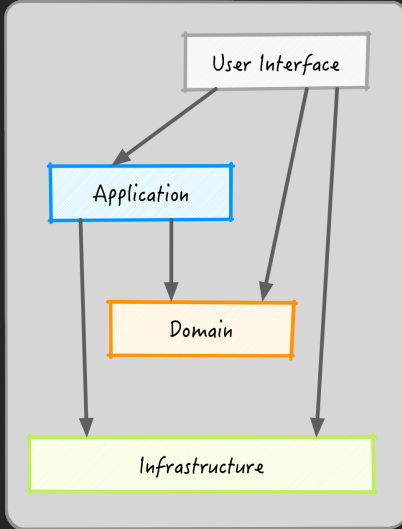
Tactical Design

Architecture

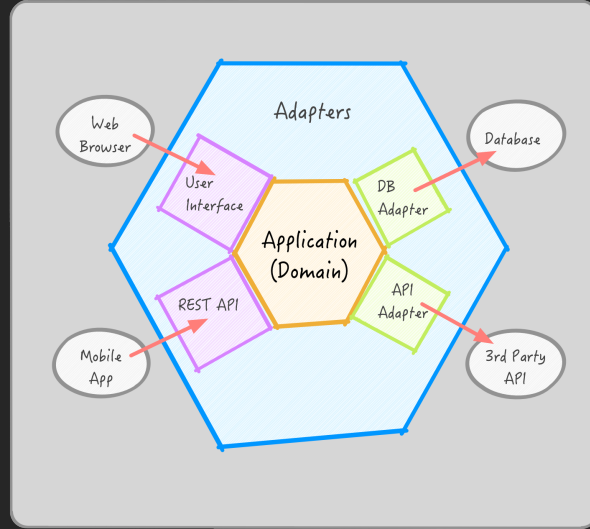


Architecture

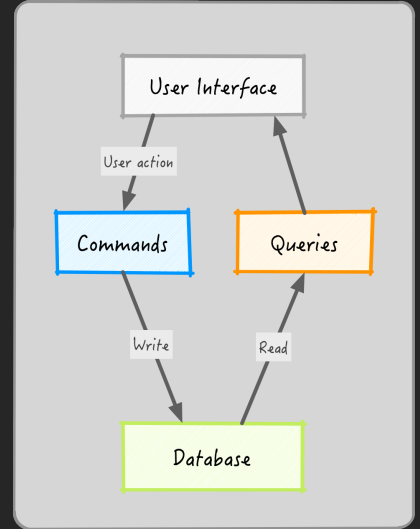
Layered



Ports & Adapters (a.k.a Hexagonal)

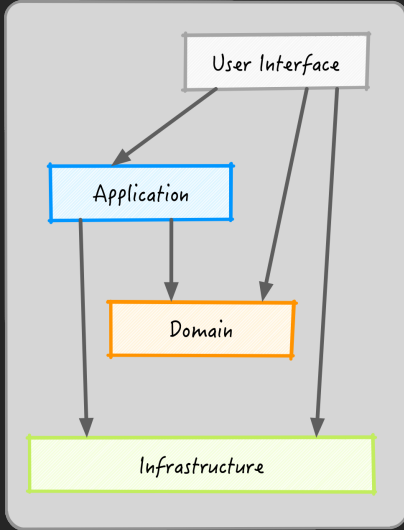


CQRS

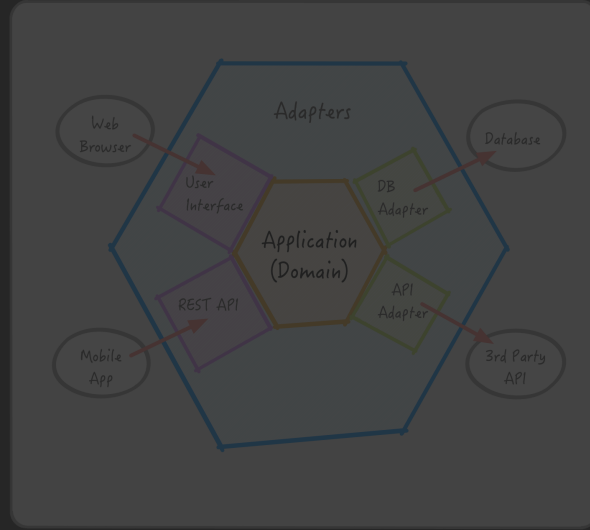


Architecture

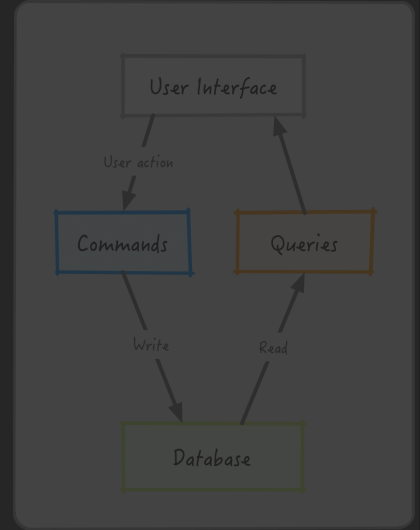
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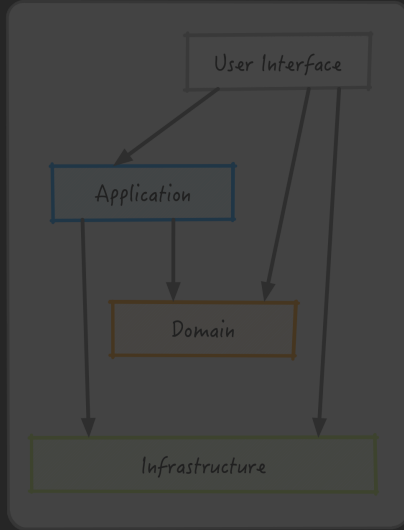


CQRS

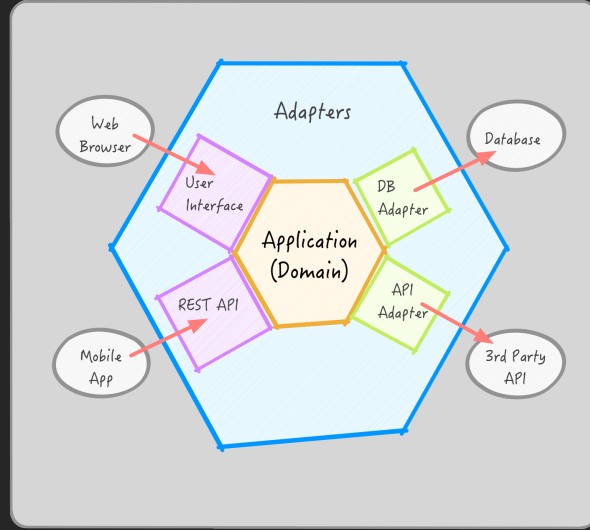


Architecture

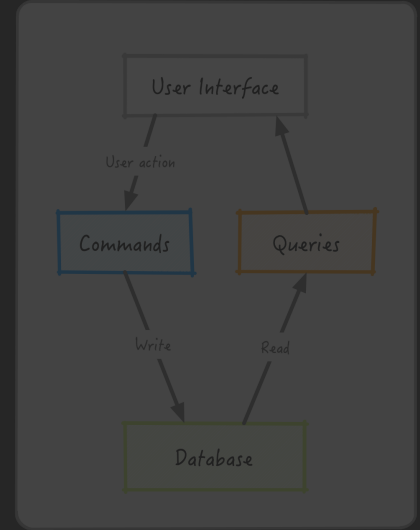
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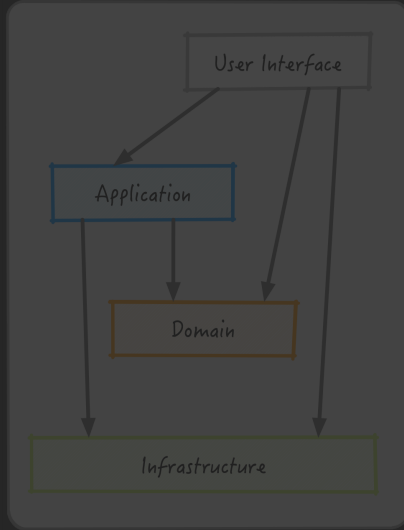


CQRS

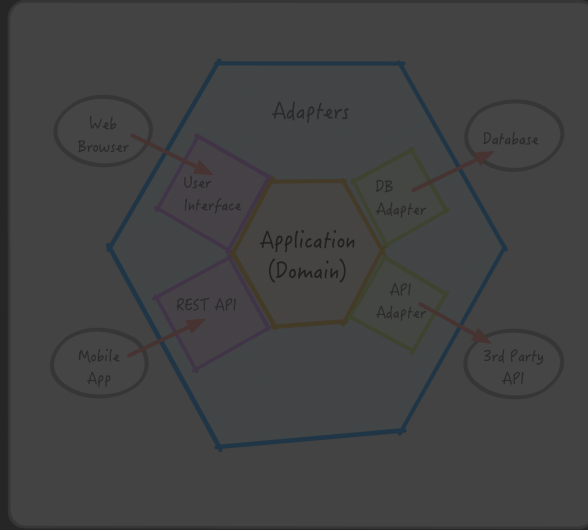


Architecture

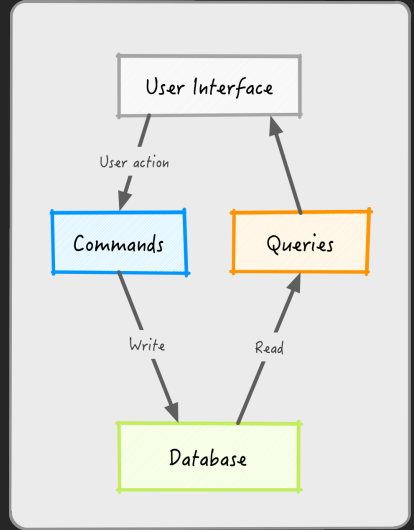
Layered



Ports & Adapters (a.k.a Hexagonal)



CQRS



To sum up



To sum up



"Domain-Driven Design is about creating shared understanding of the problem space that is reinforced ubiquitously via conversations, code and diagrams."

Nick Tune





Thank you!

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