Microservices Lessons Learned

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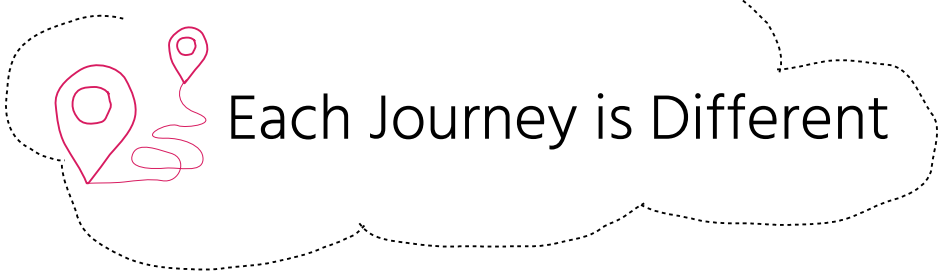


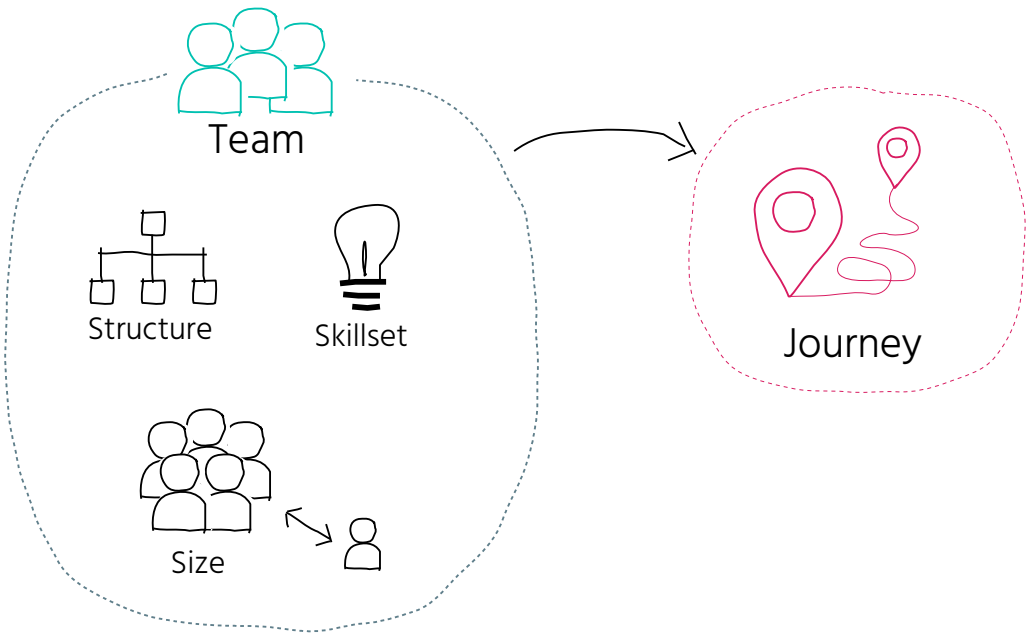
Each Journey is Different

"People try to copy Netflix,
but they can only copy what they see.
They copy the results, not the process."

Adrian Cockcroft, AWS VP Cloud Architect,
former Netflix Chief Cloud Architect

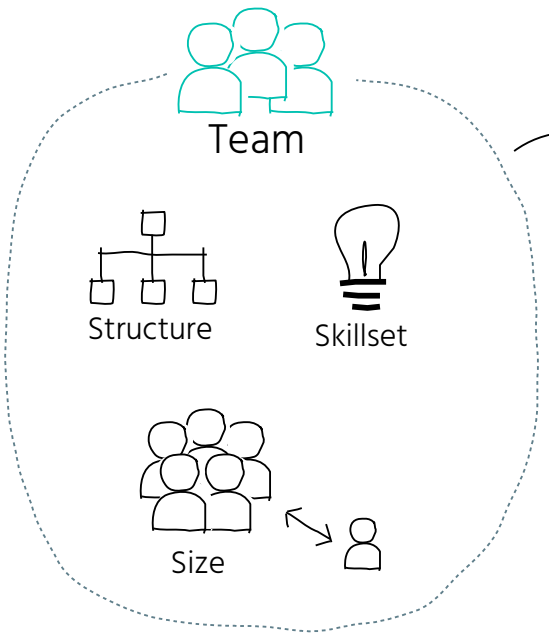
Each Journey is Different

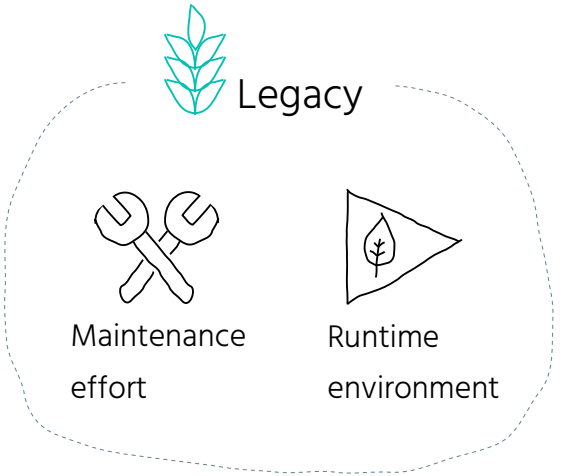
Affecting Circumstances



Each Journey is Different

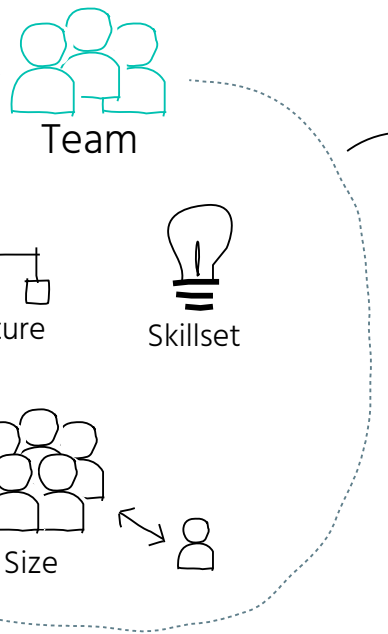
Affecting Circumstances

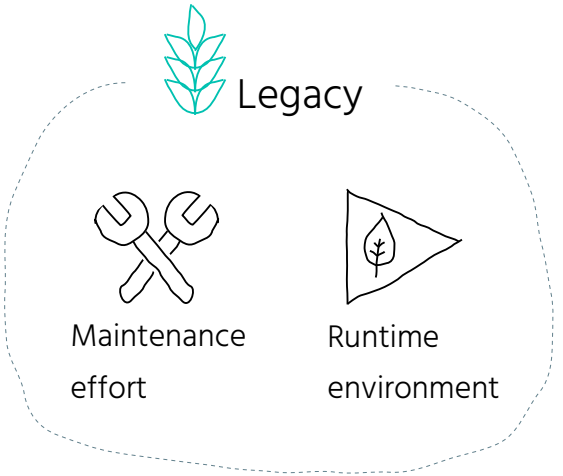


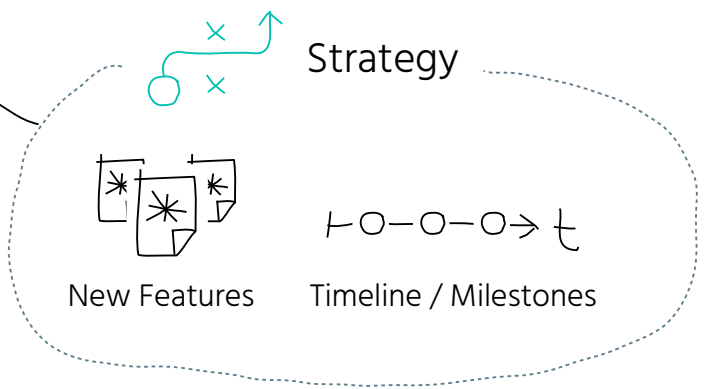


Each Journey is Different

Affecting Circumstances







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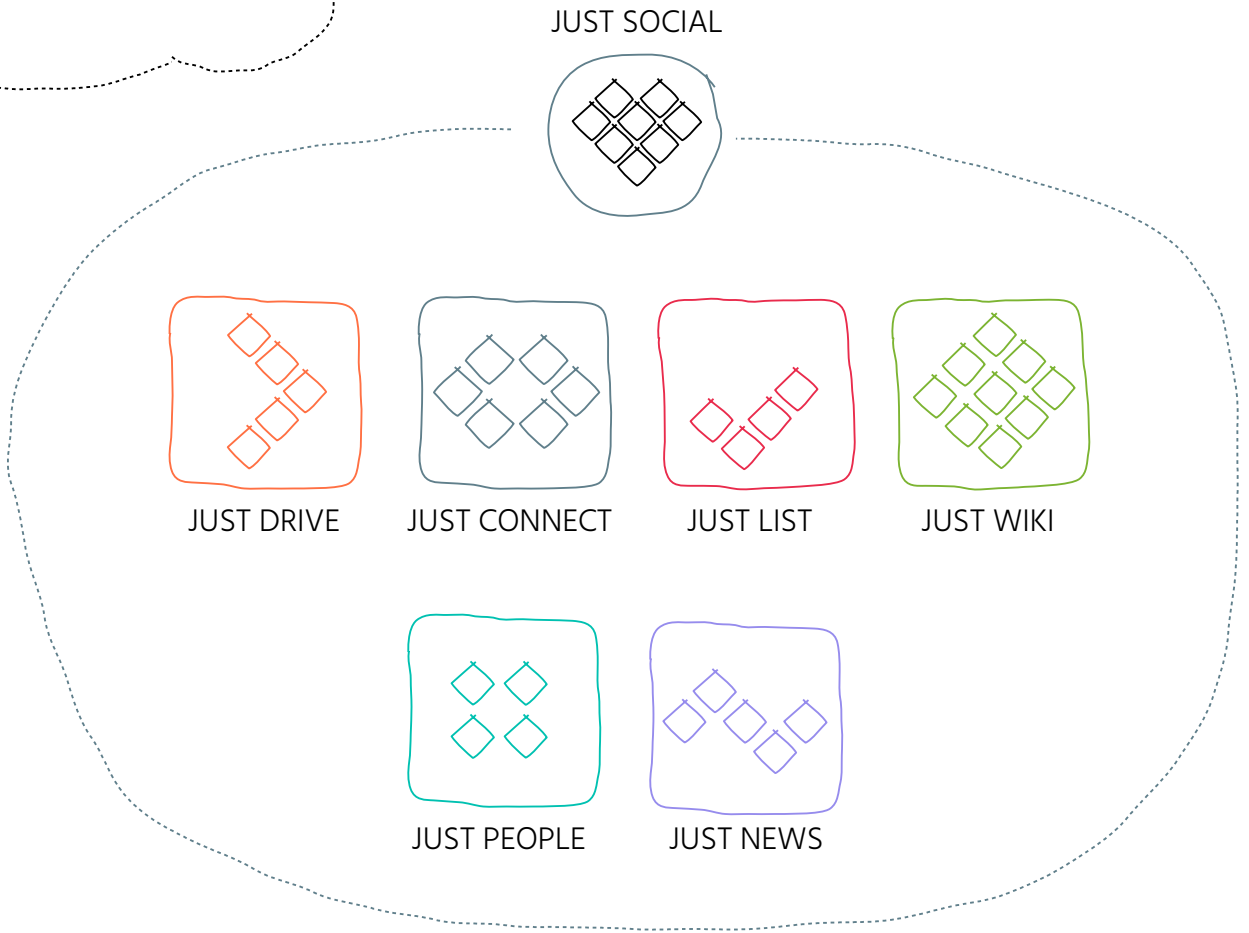
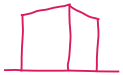
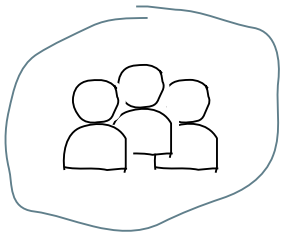

JUST SOCIAL
JUST DRIVE
JUST CONNECT
JUST LIST
JUST WIKI
JUST PEOPLE
JUST NEWS

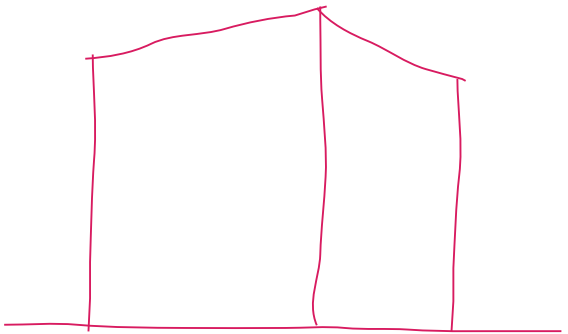
At the Beginning



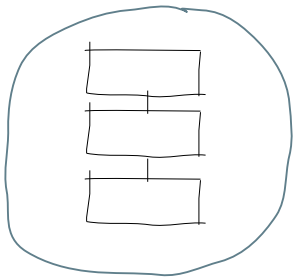
A Monolith in Every Aspect



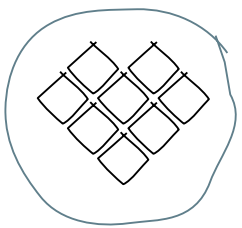
One team



Single Unit



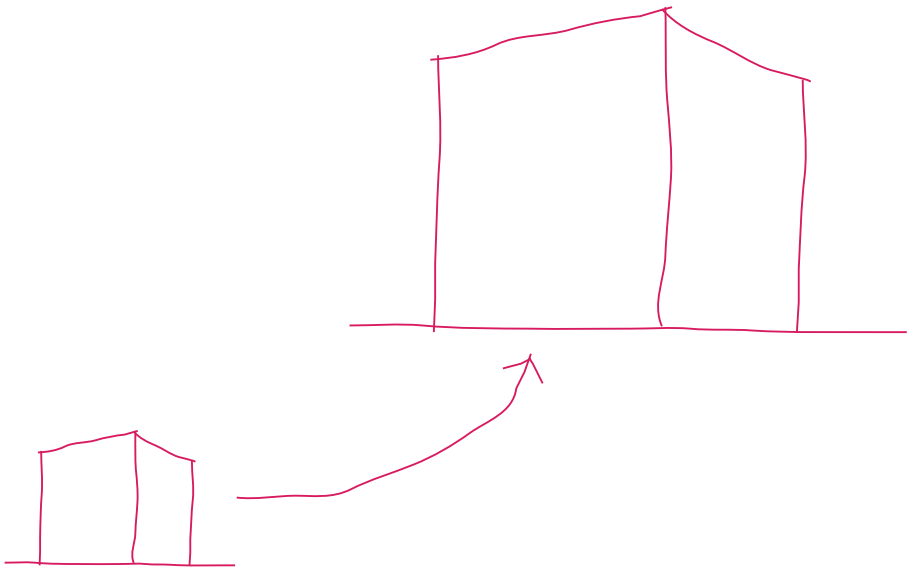
One technology stack



One collaboration product

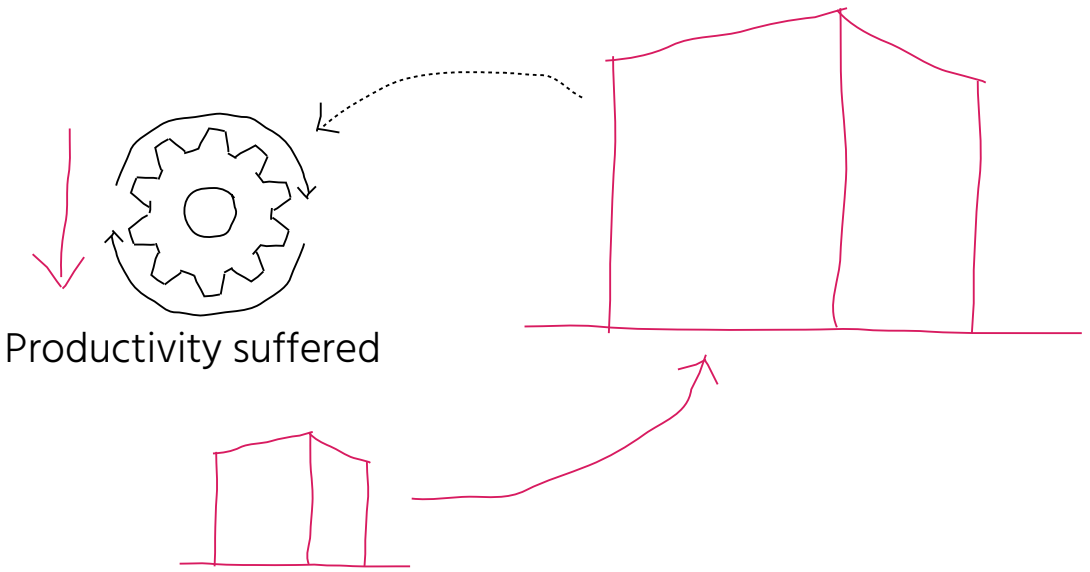
Background

$\longmapsto t$ After an Evolving Time



Background

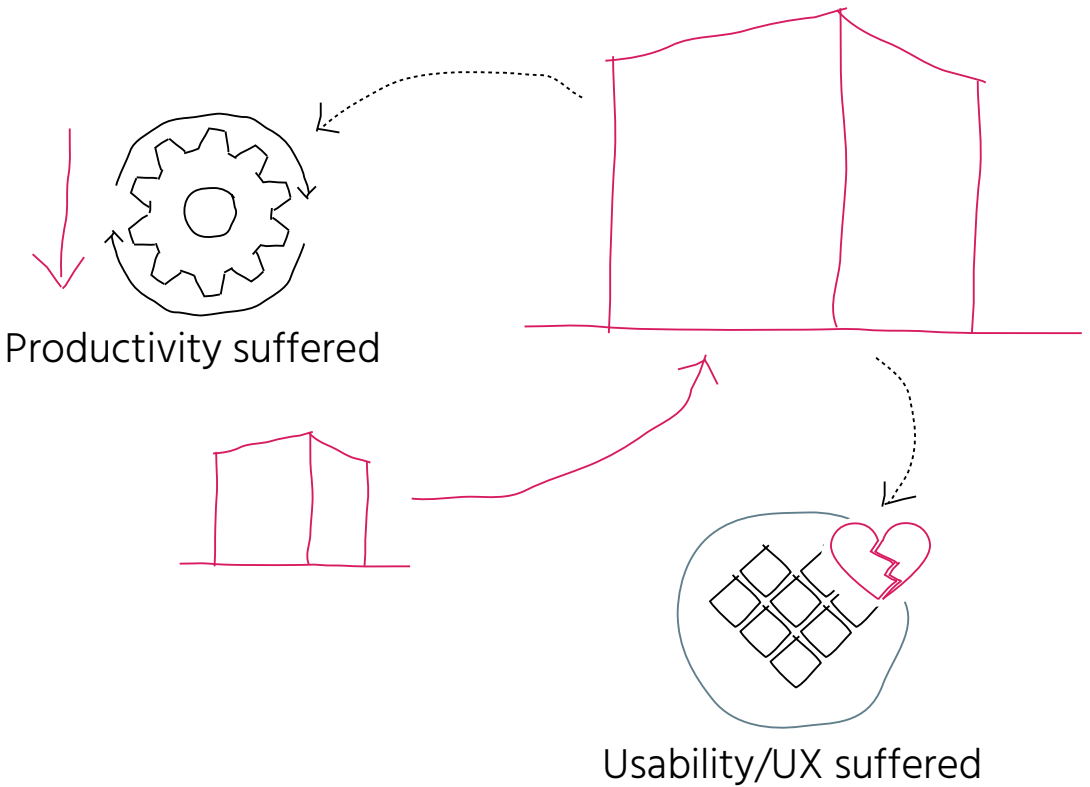
After an Evolving Time



Productivity suffered

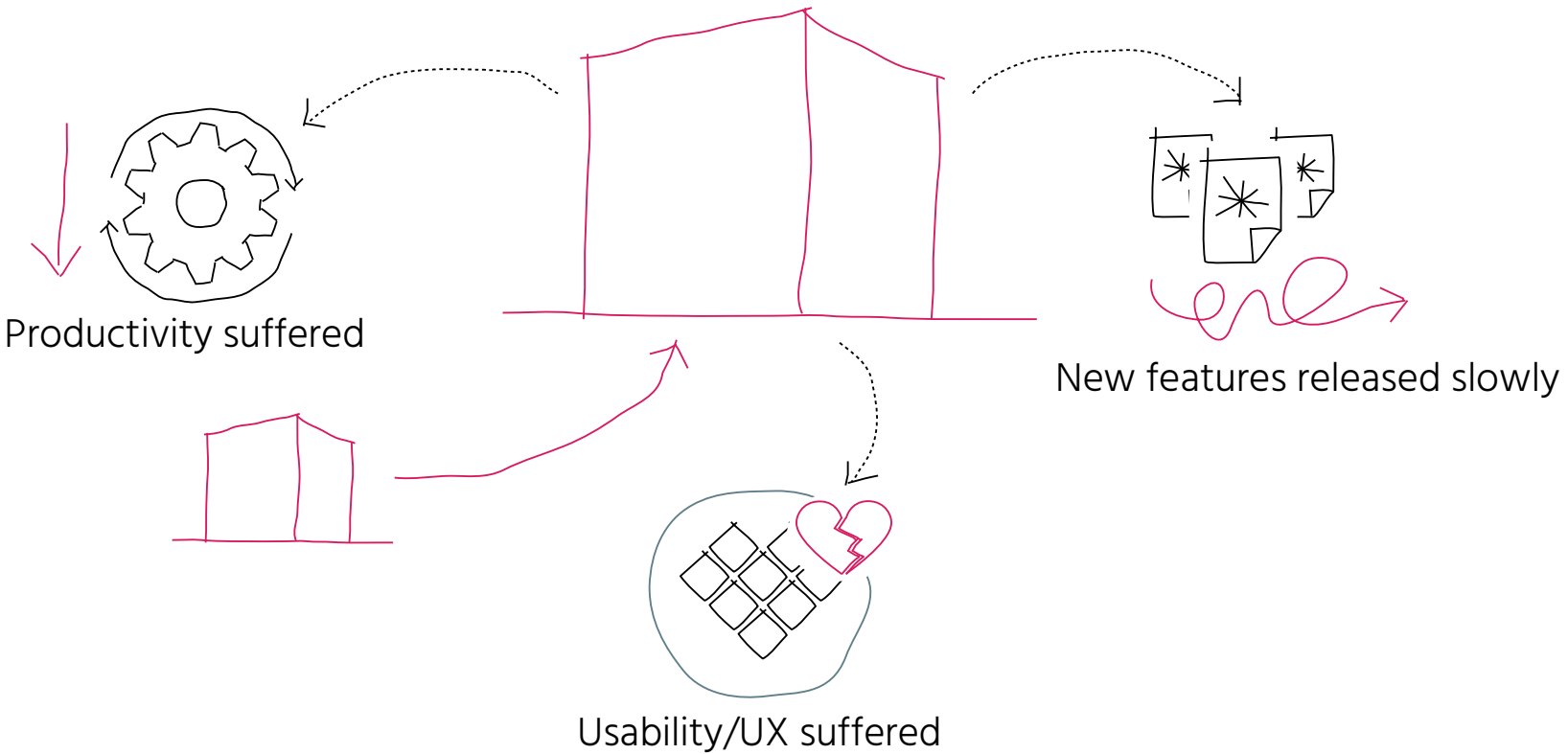
Background

After an Evolving Time



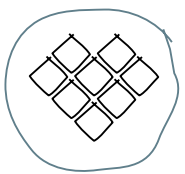
Background

After an Evolving Time

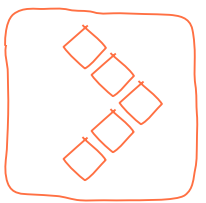


Background

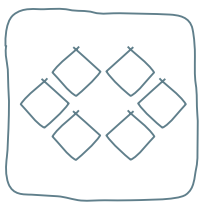
Separate Collaboration Apps



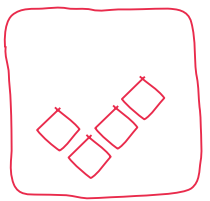
JUST SOCIAL



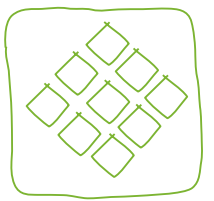
JUST DRIVE



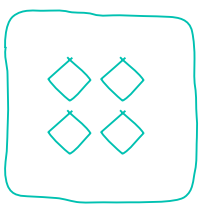
JUST CONNECT



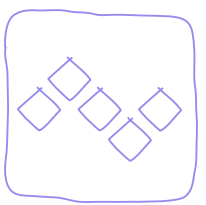
JUST LIST



JUST WIKI



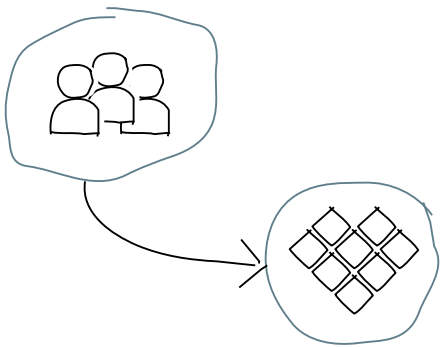
JUST PEOPLE

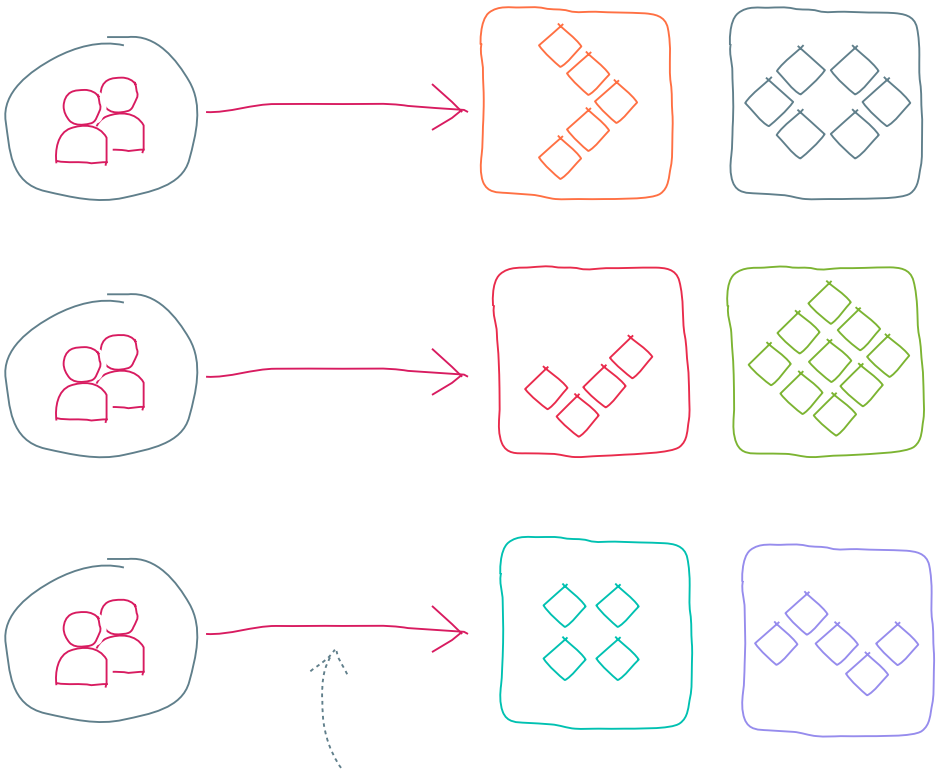


JUST NEWS

Background

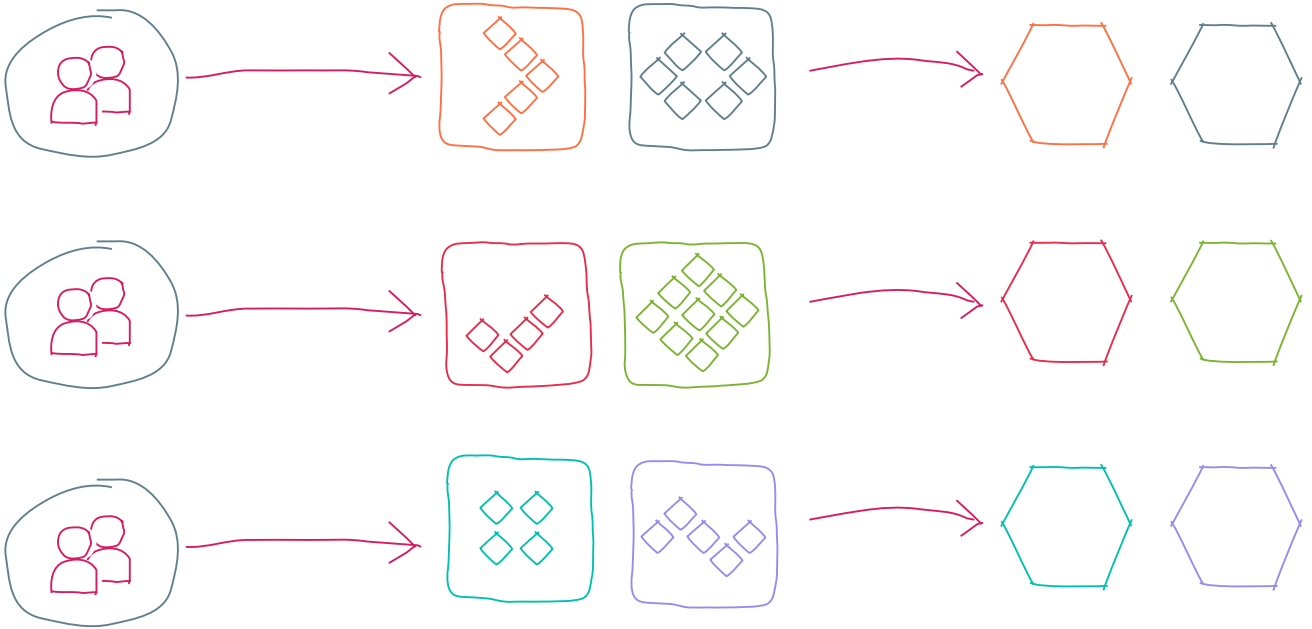
Separate, Autonomous Teams





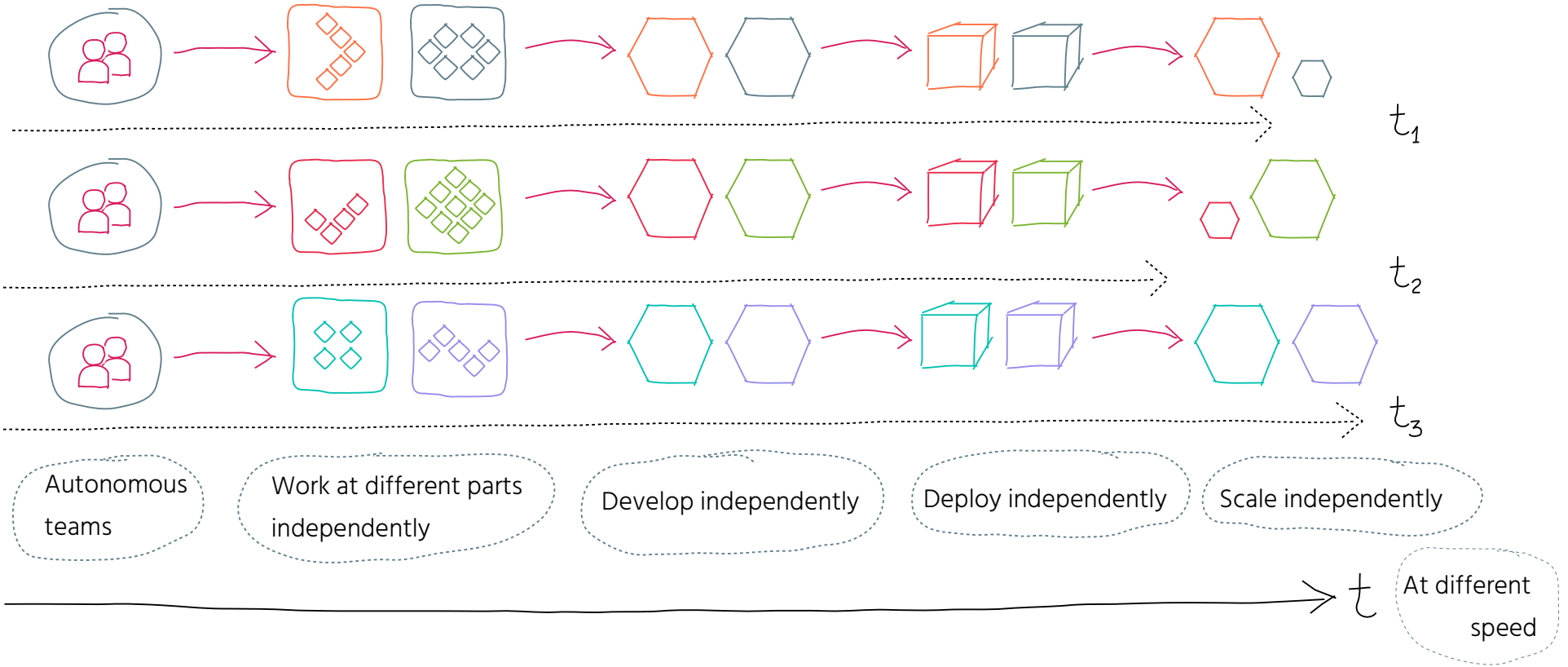
Background

In The Long Run



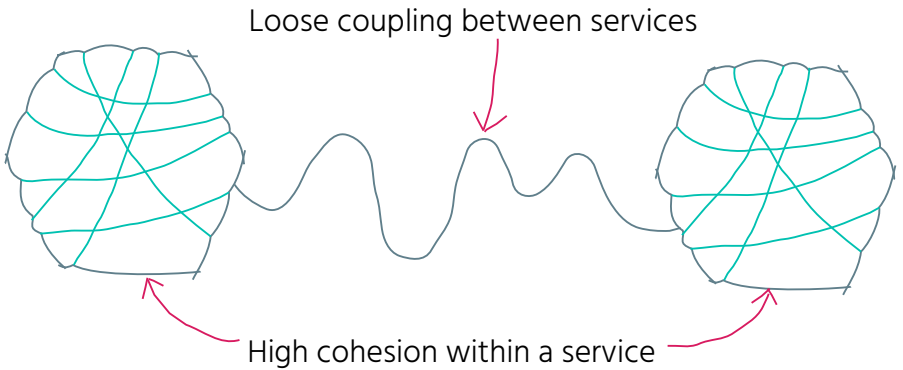
Background

Our Motivation for Microservices



Decomposition Strategy

Identify Bounded Contexts



Decomposition Strategy

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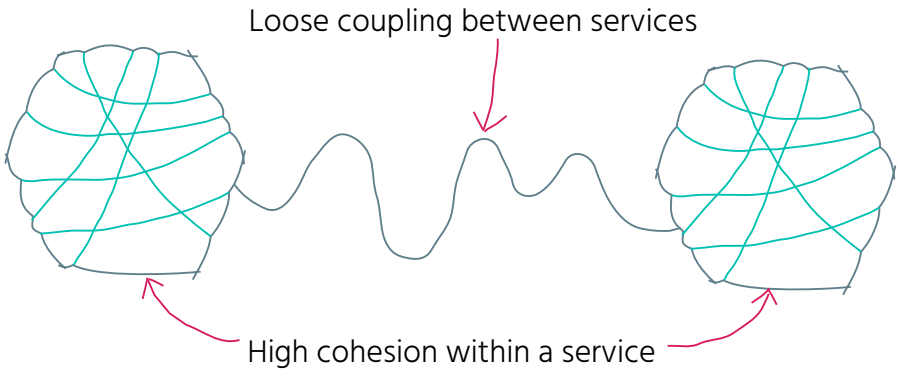


Bounded Context

Related behaviour

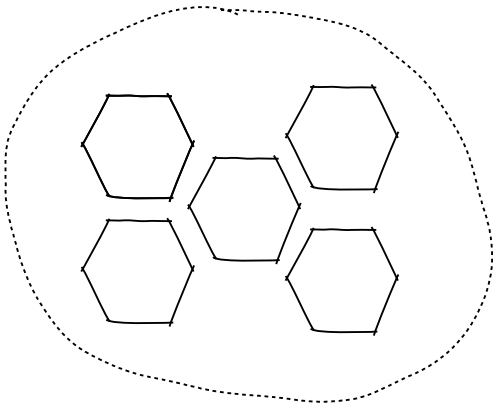
Well-defined business function

Semantic boundary around domain model

Decomposition Strategy

Identify Bounded Contexts

Bounded Contexts



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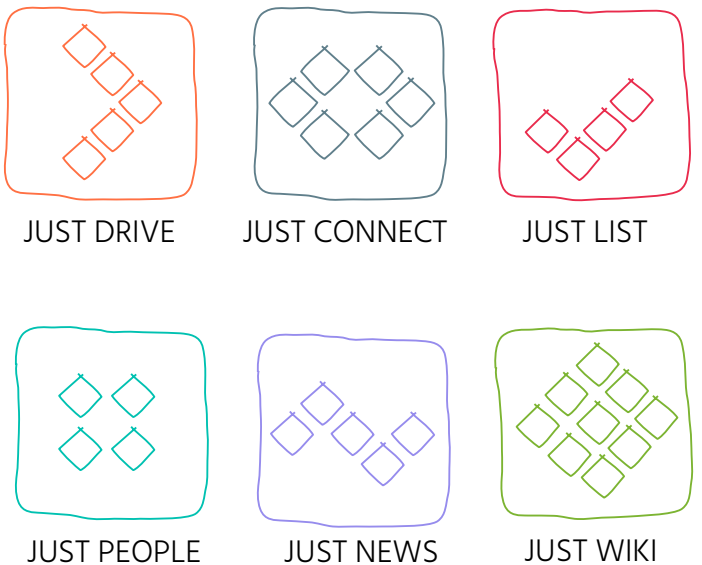
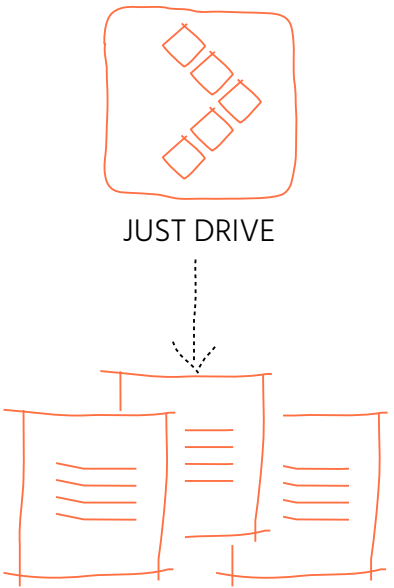


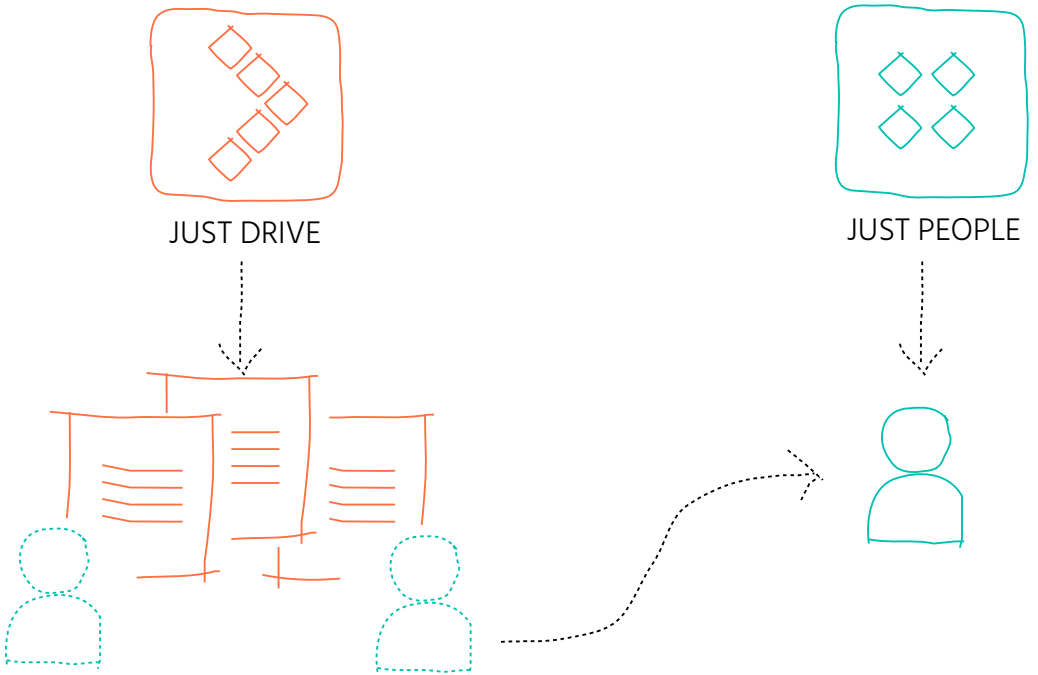
Decomposition Strategy

Co-Existing Service From Scratch



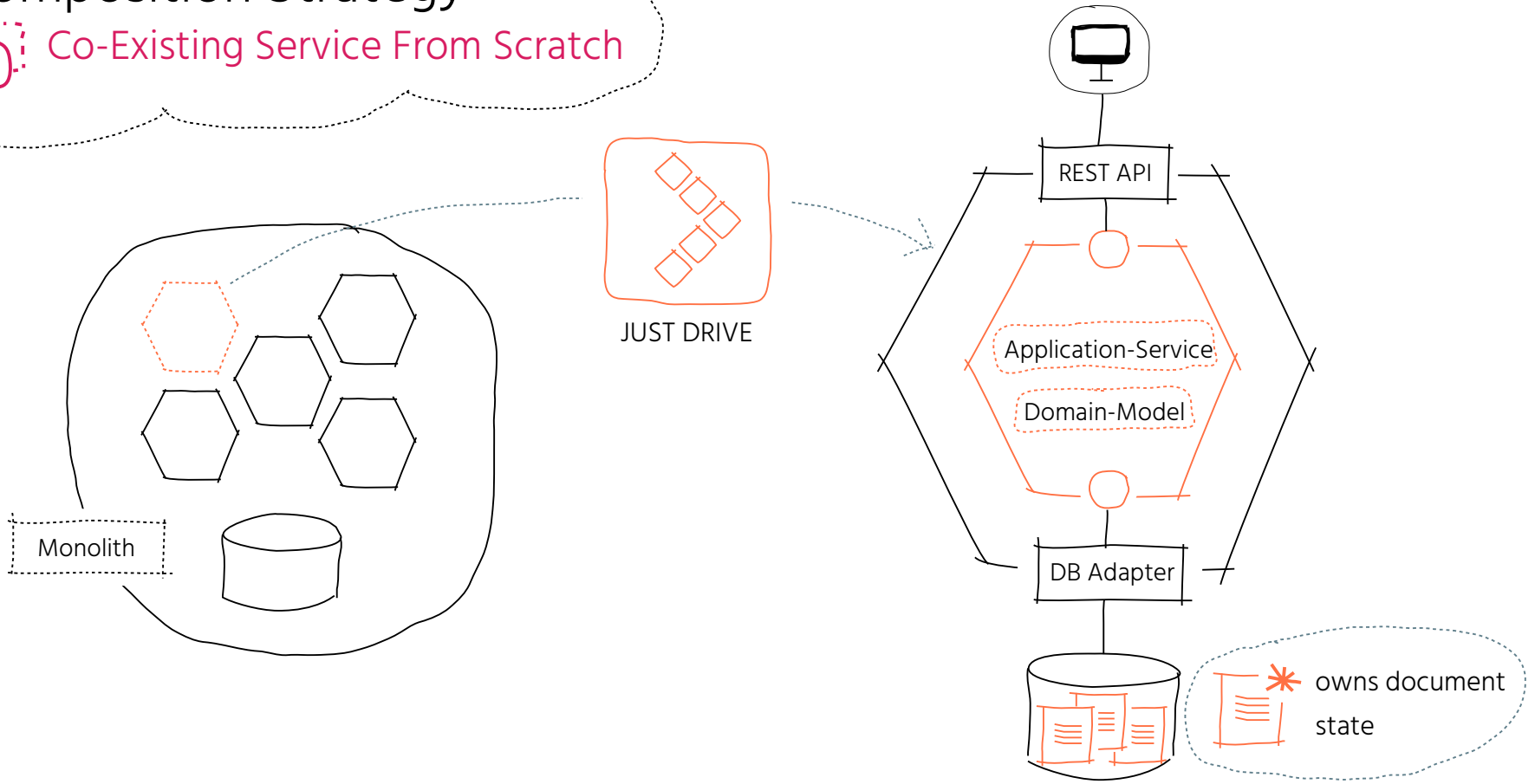
Decomposition Strategy

Co-Existing Service From Scratch



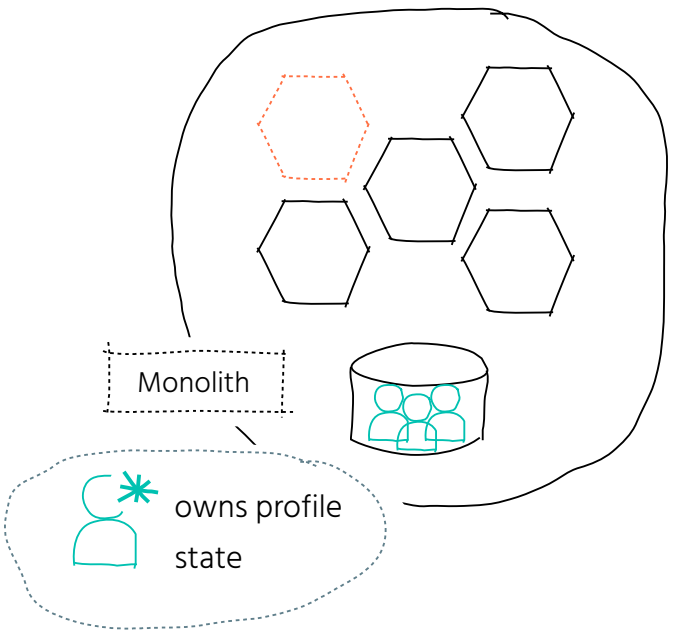
Decomposition Strategy

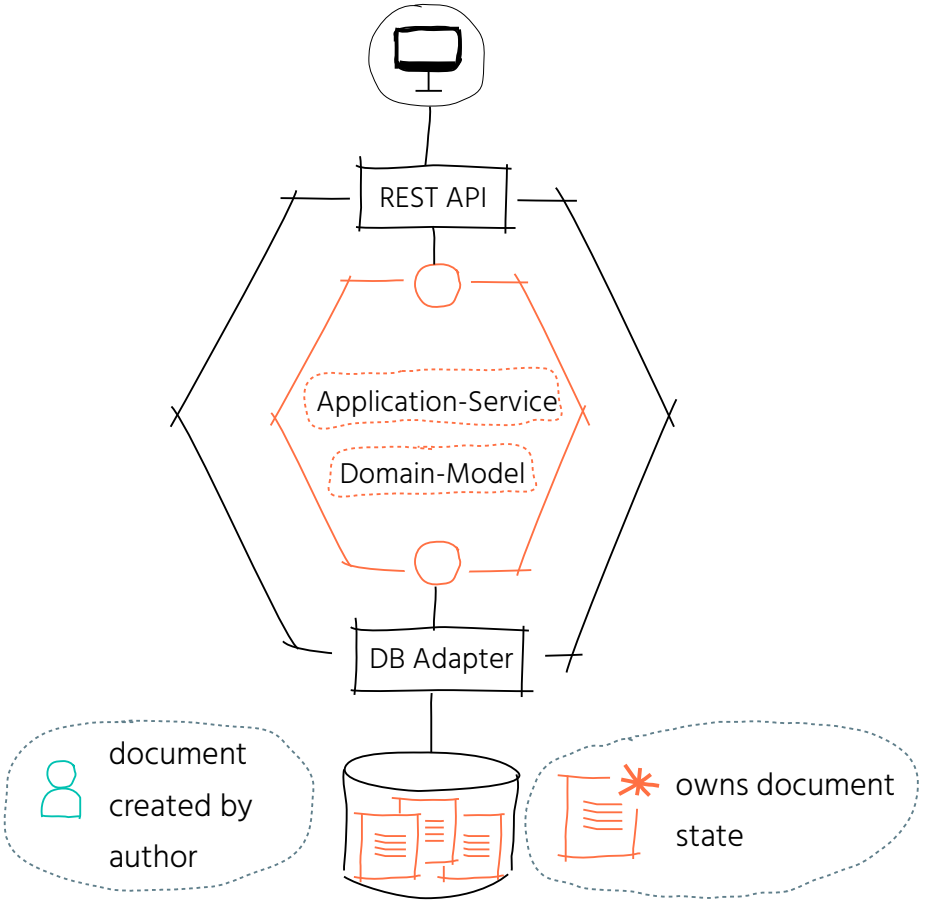
Co-Existing Service From Scratch



Decomposition Strategy

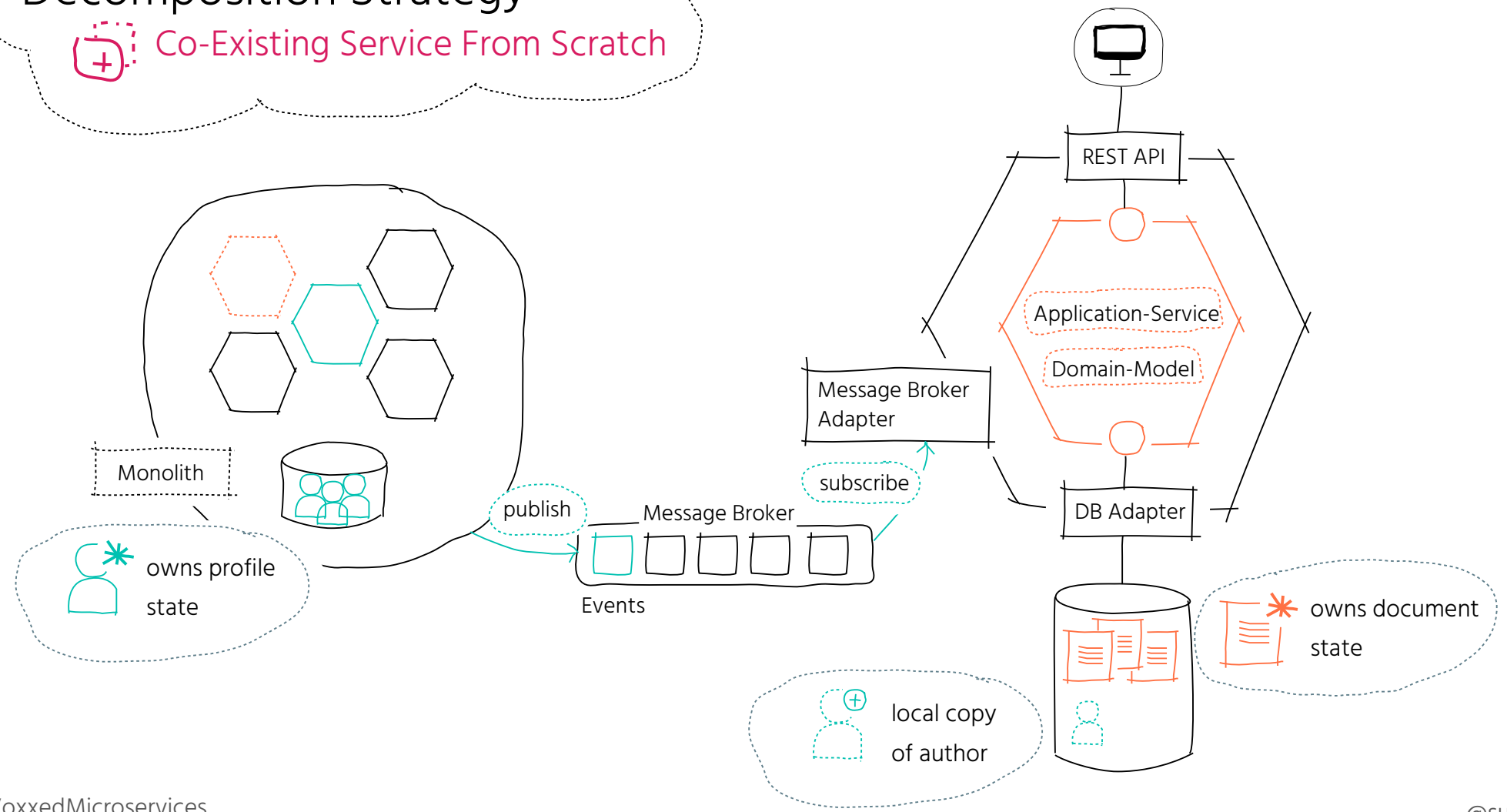
Co-Existing Service From Scratch





Decomposition Strategy

Co-Existing Service From Scratch



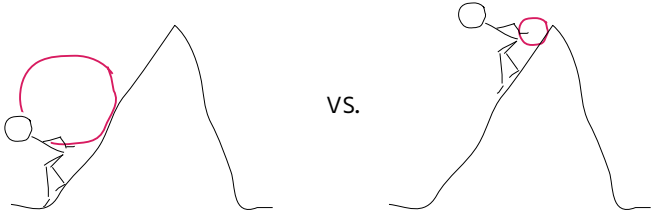
Decomposition Strategy

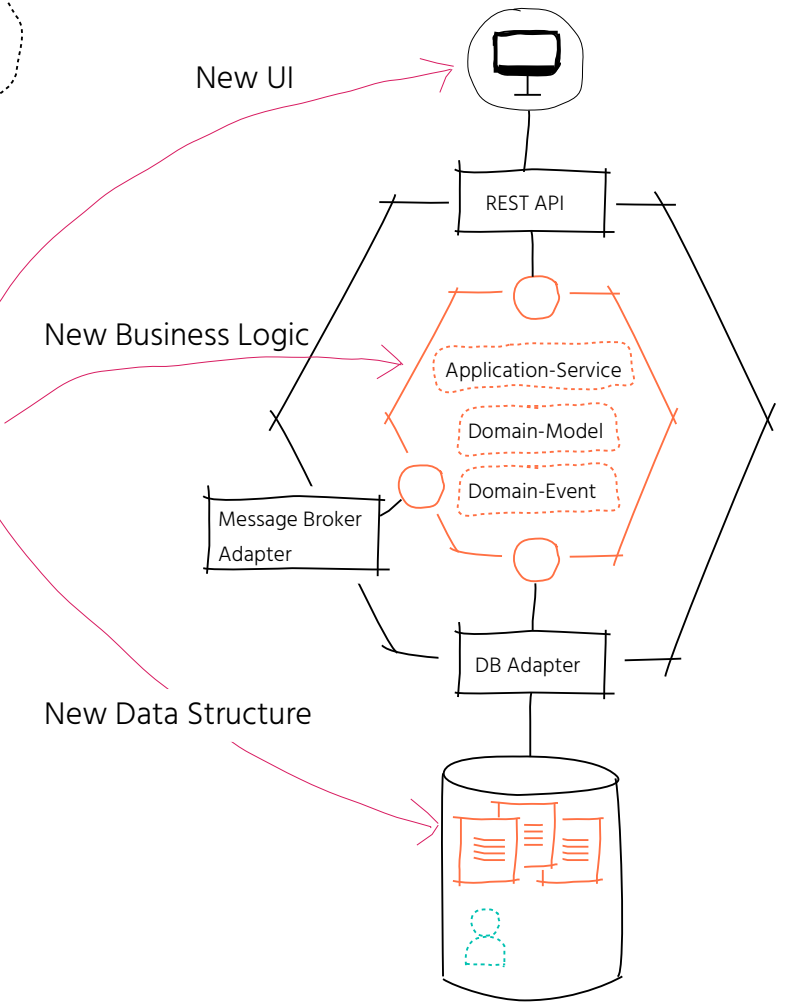
Co-Existing Service From Scratch

Good approach in general,

but we did too many steps at once

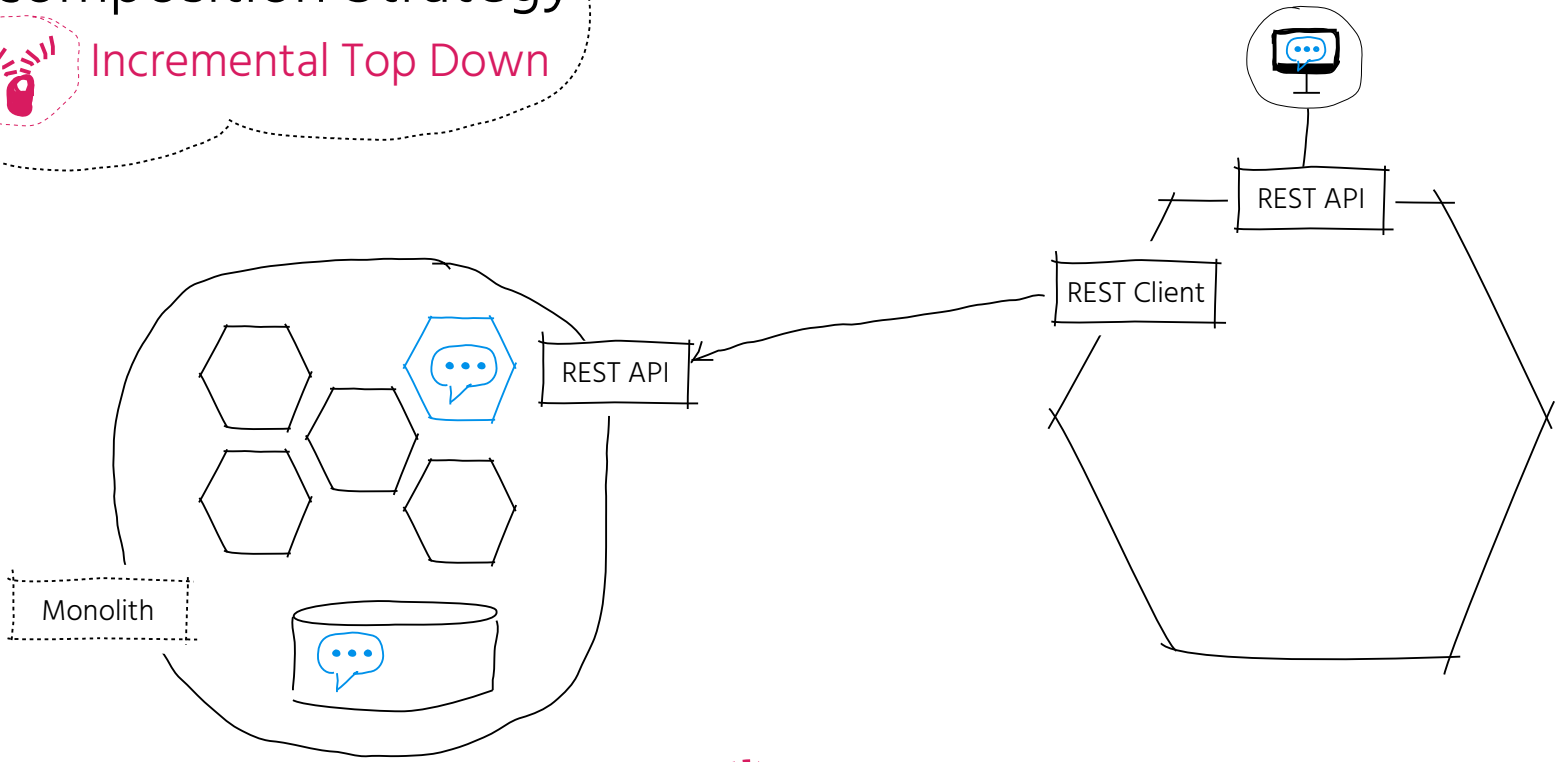
=> Not optimal to start with





Decomposition Strategy

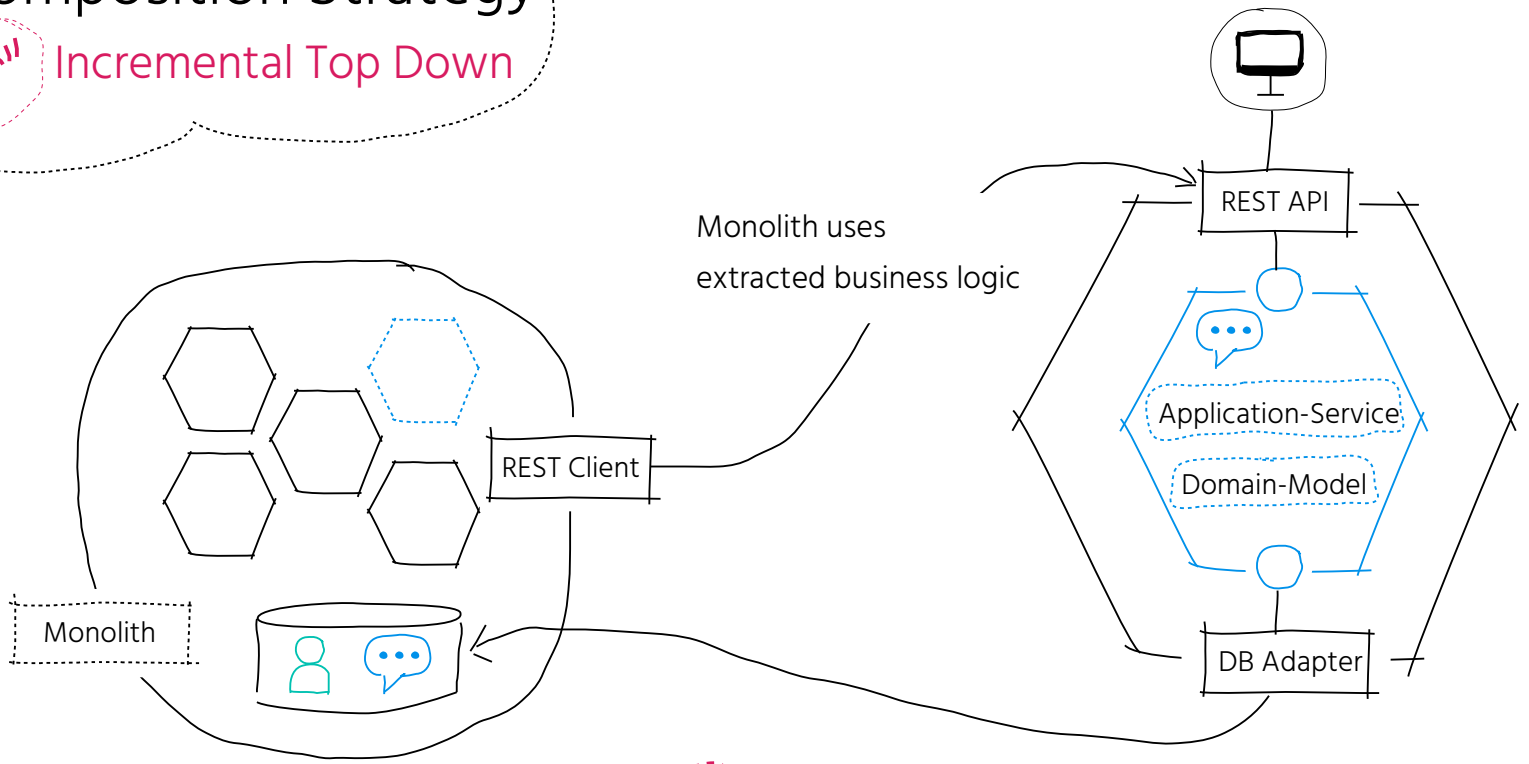
Incremental Top Down



1. Extracting Web App

Decomposition Strategy

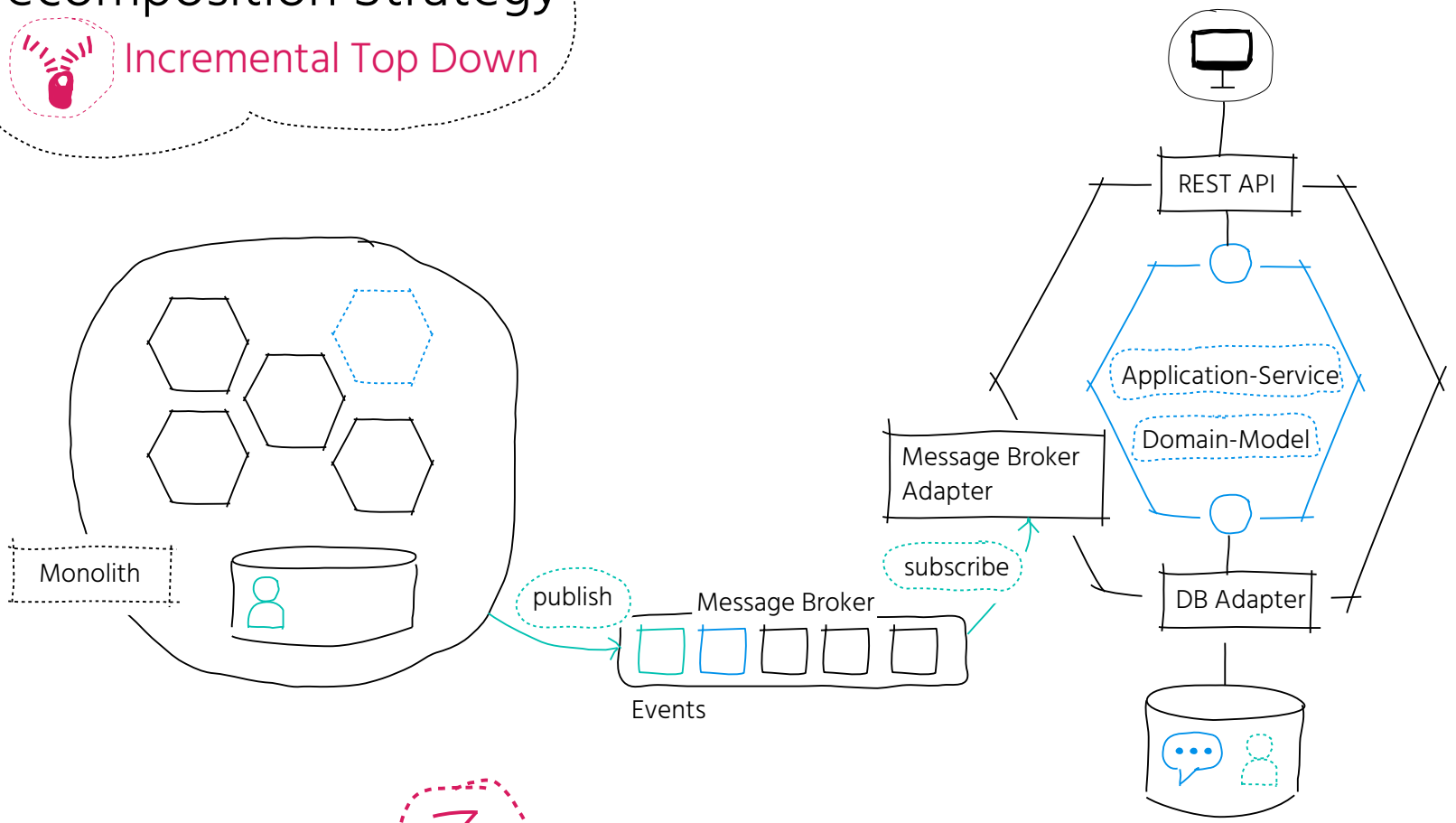
Incremental Top Down



2. Extracting Business Logic

Decomposition Strategy

Incremental Top Down

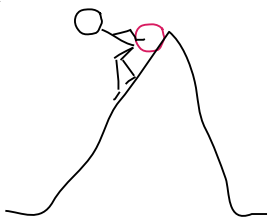


3. Splitting Data Storage

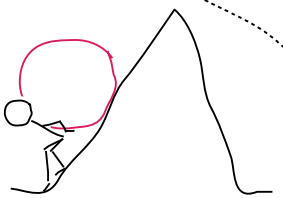
Decomposition Strategy

1.—
2.—
3.—

Which One First?

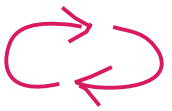


vs.



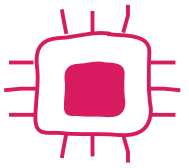
Easy to Extract

Early experiences w/ Microservices



Changing Frequently

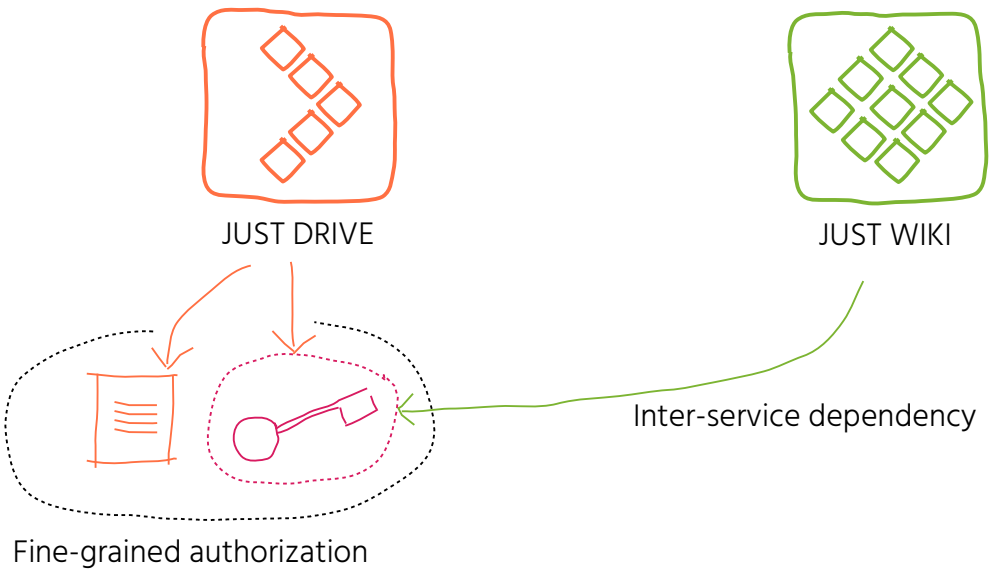
Greatest benefit after extraction



Different Resource Consumption

Cross-Cutting Concerns

Authorization



Cross-Cutting Concerns

Authorization

I have a new service that needs authorization. Where is the authz service I could use?

Not there, yet. Sorry!

Ok, then I am putting my code to the place where authz handling exists ... to the monolith.

Feeding the monolith

Ok, then I am implementing authz in my local service.

Re-implementing authz w/ every new service

Cross-Cutting Concerns

Handle Them Early

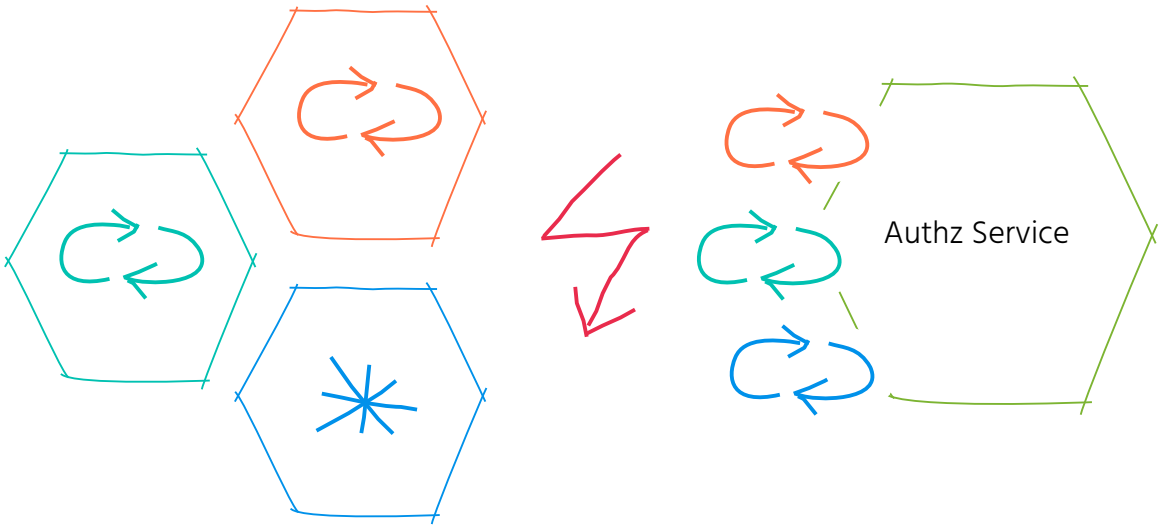
Feeding the monolith

Re-implementing authz w/ every new service

Handle Cross-Cutting Concerns Early

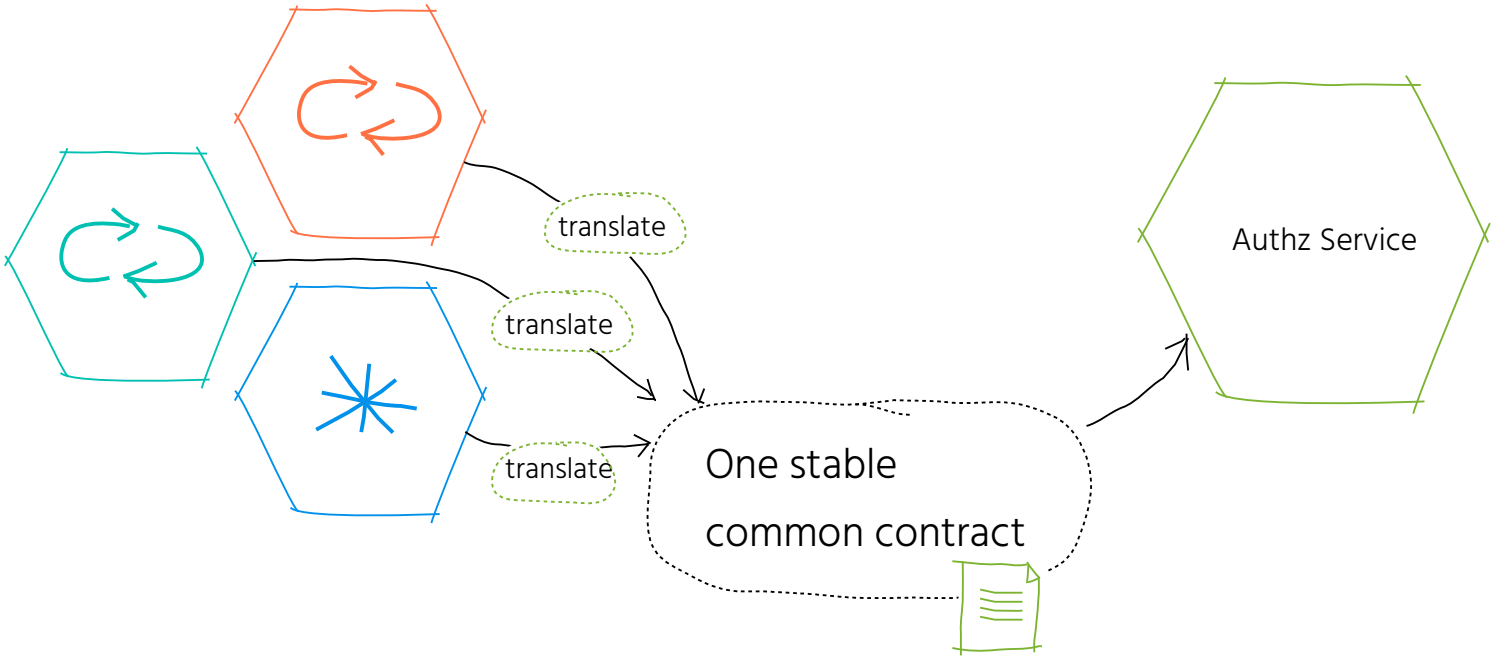
Cross-Cutting Concerns

Avoid A Distributed Monolith

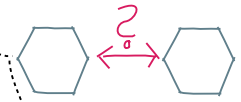


Cross-Cutting Concerns

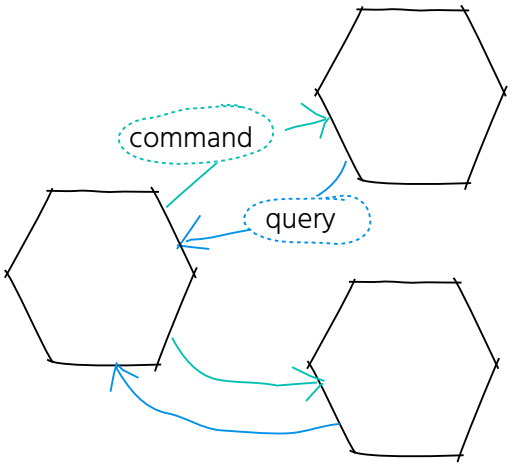
Avoid A Distributed Monolith



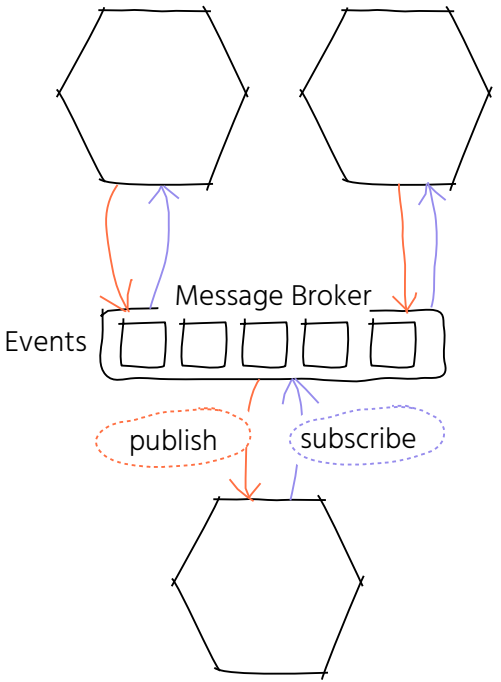
Service Interaction



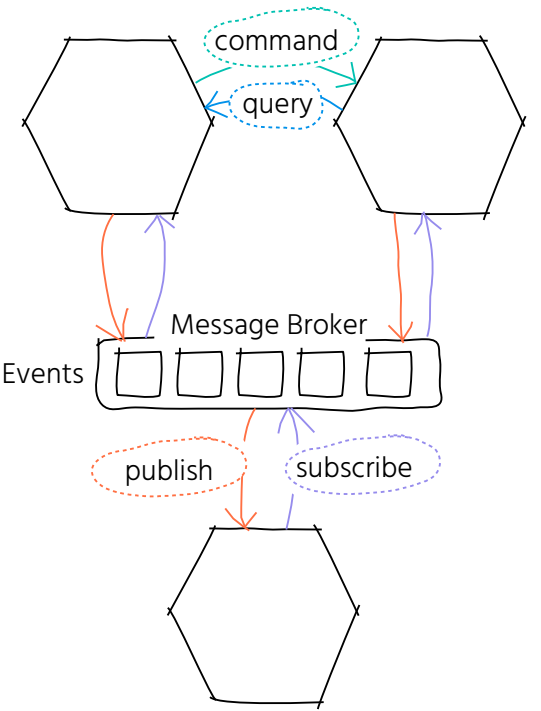
Request-Driven / Event-Driven



Request-Driven

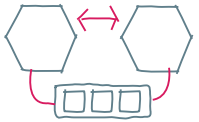


Event-Driven

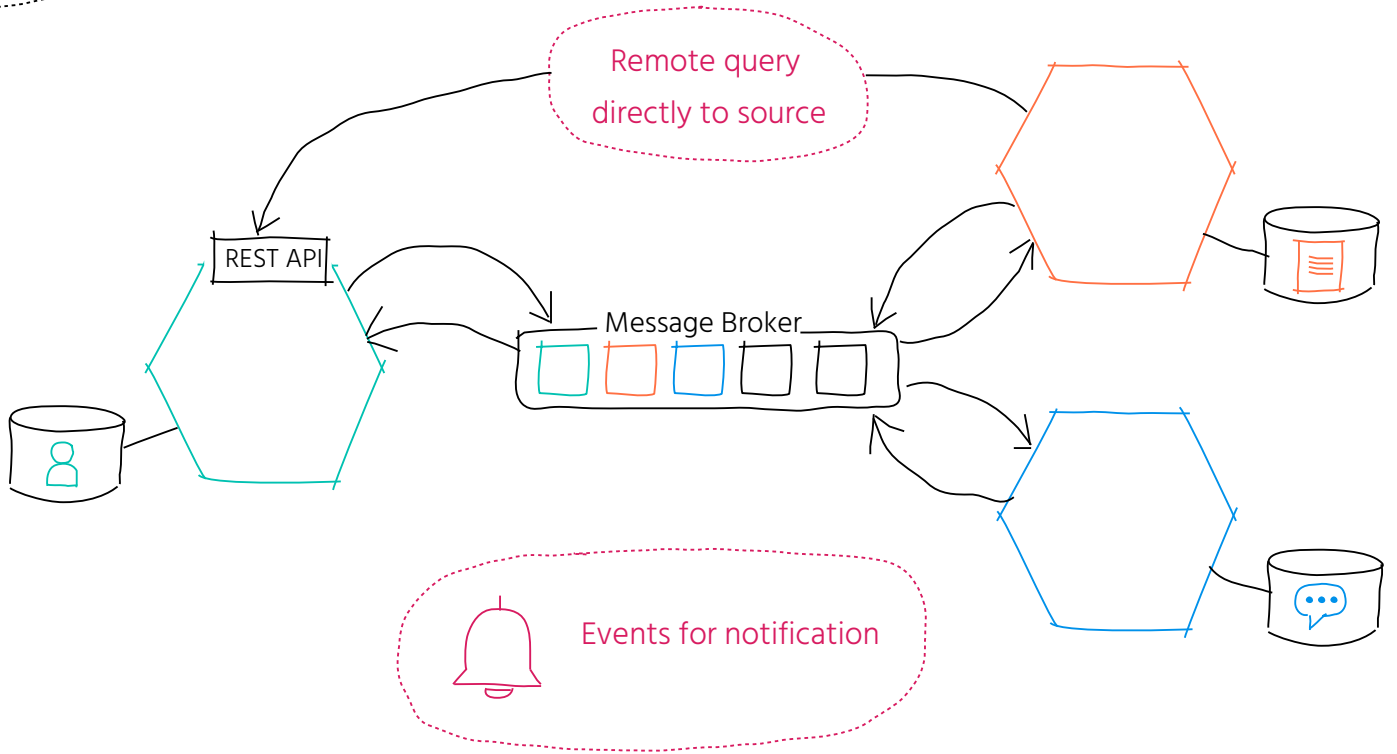


Hybrid

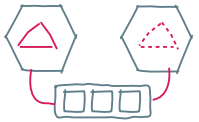
How To Manage Shared Data?



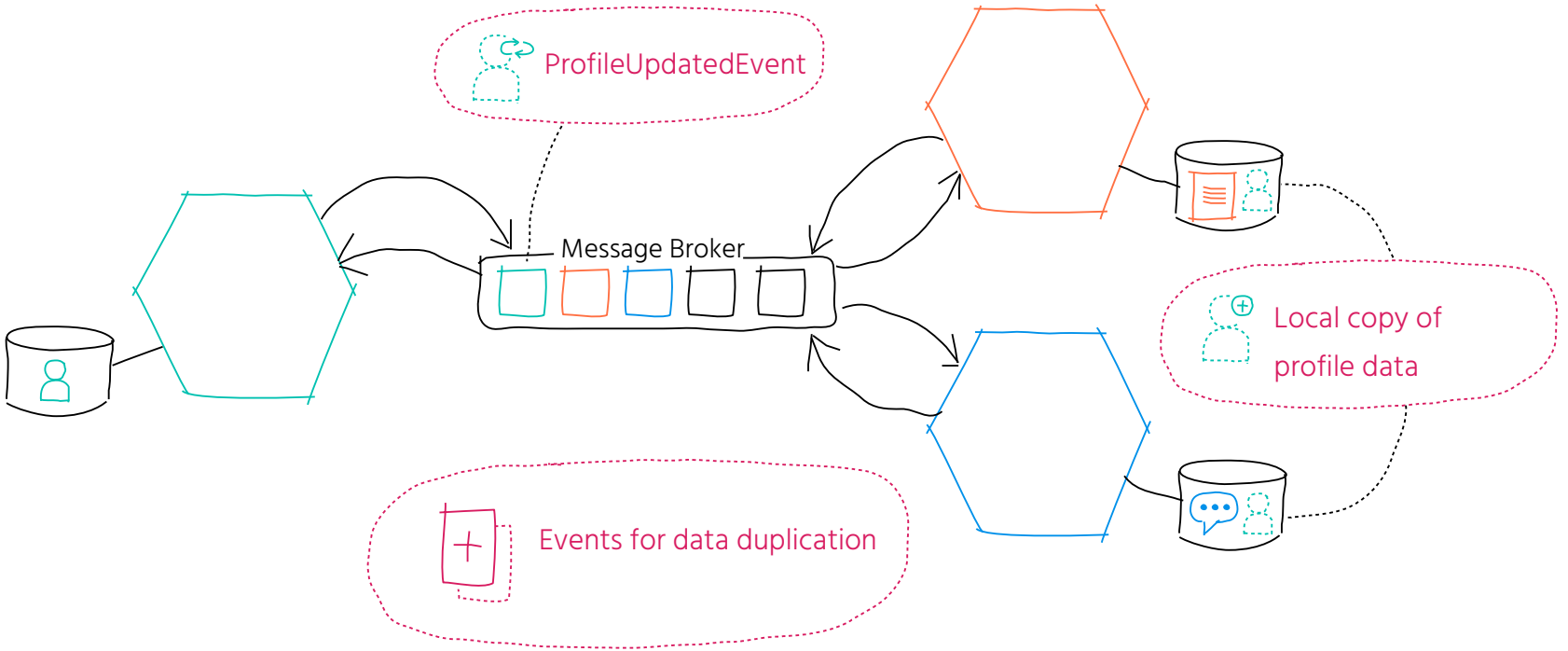
Hybrid Model



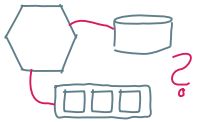
How To Manage Shared Data?



Event Driven State Transfer

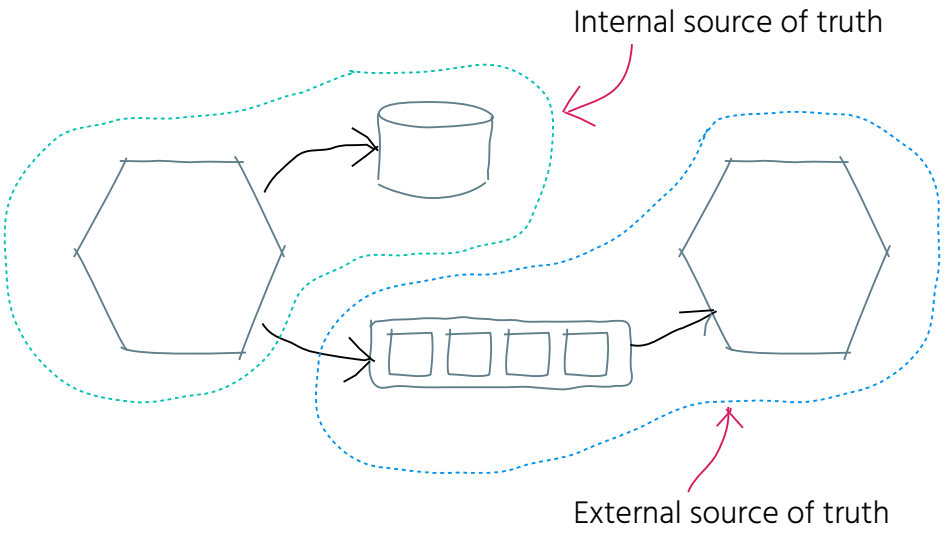


How To Manage Shared Data?



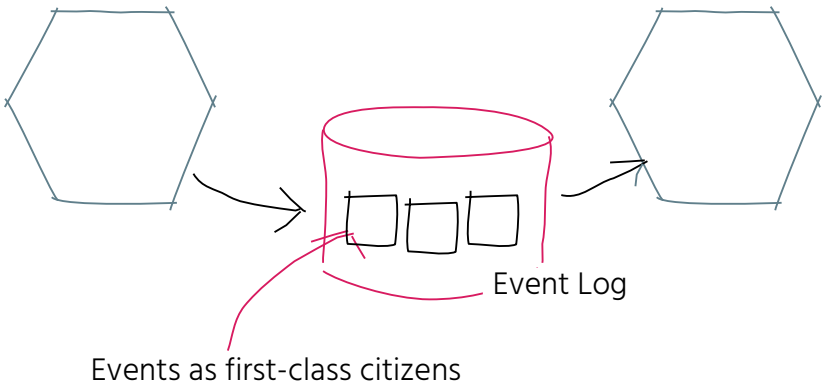
Source Of Truth

Multiple sources of truth

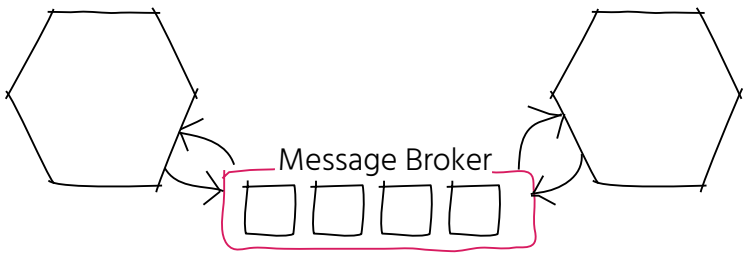


"Traditional" Event-Driven System

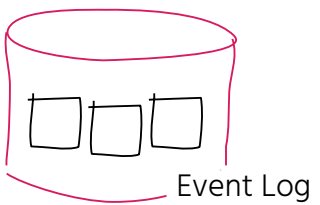
Single source of truth



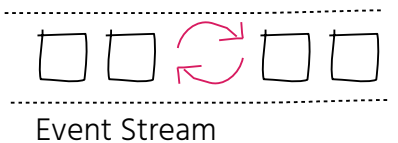
Event Store



Messaging System



Storage System

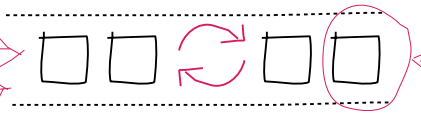


Streaming Platform

How To Manage Shared Data?

Kafka Streams

Unbounded, ordered sequence of data records

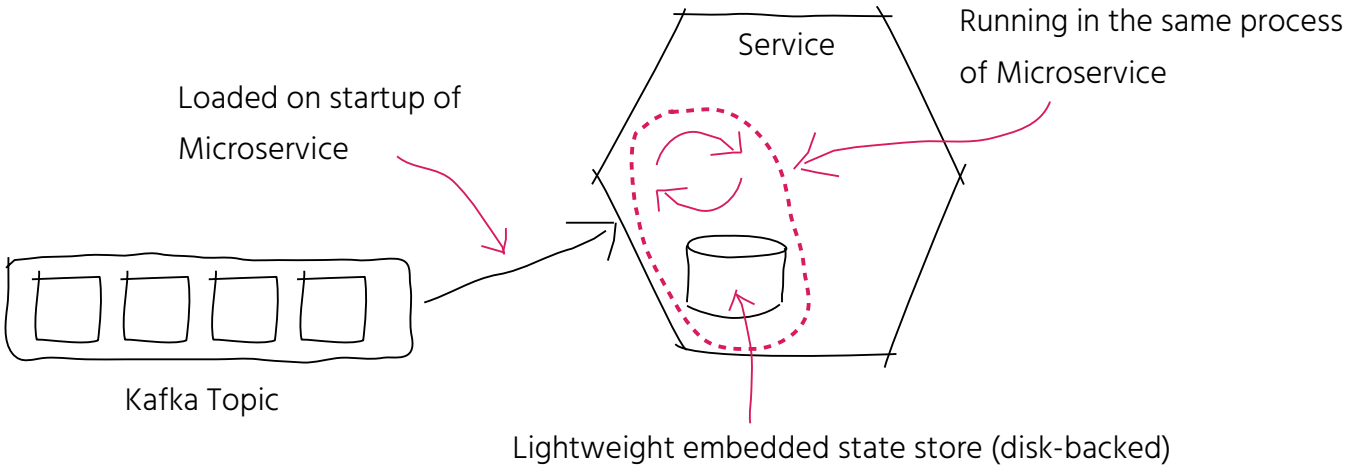


Continuously updating

Key-value pair

How To Manage Shared Data?

Kafka Streams



Streams make data available wherever it's needed

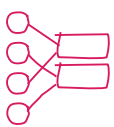
How To Manage Shared Data?

Kafka Streams

Kafka Streams API

join

filter

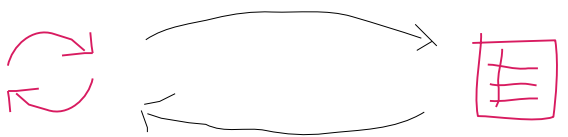


group by

aggregate

etc.

Kafka Stream-Table Duality



KStream

Changelog of state changes

(key1, value1), (key2, value2), (key 1, value 3)

KTable

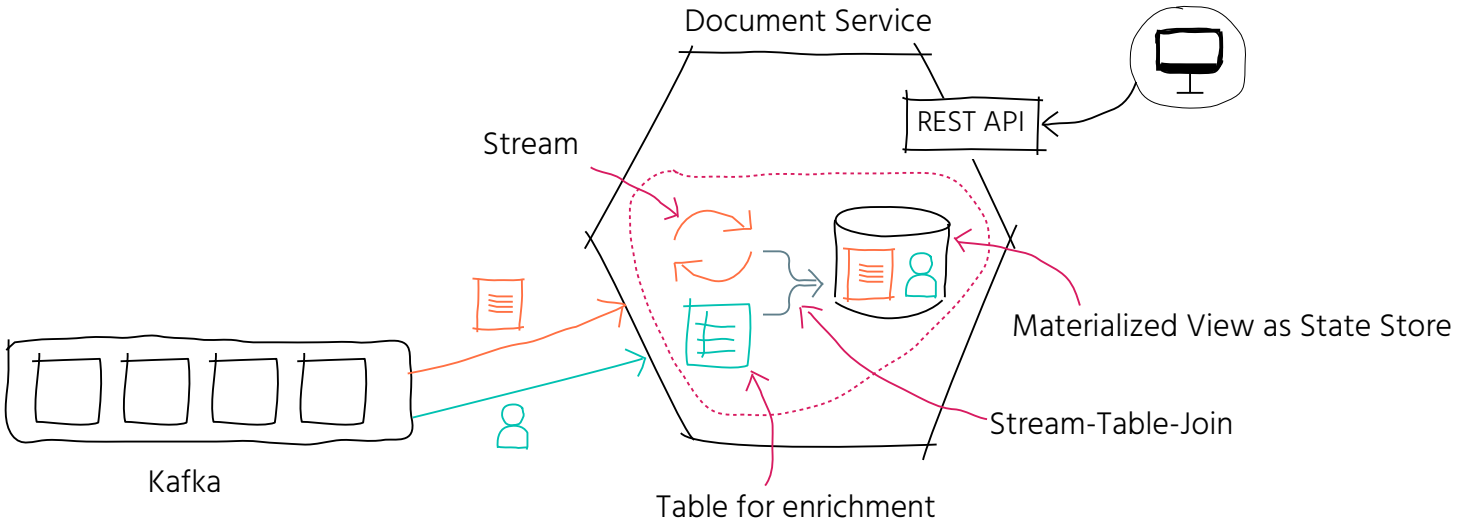
Snapshot of the latest value for each key

key1 → value3

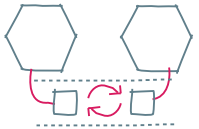
key2 → value2

How To Manage Data?

Materialized Views w/ Kafka Streams

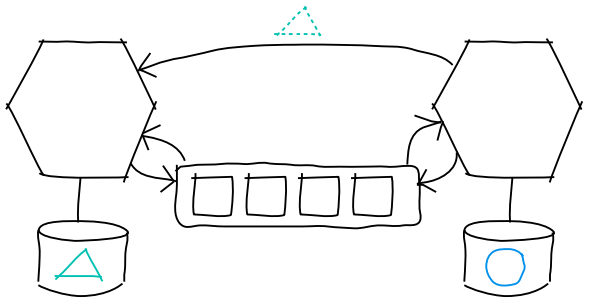


How To Manage Shared Data?



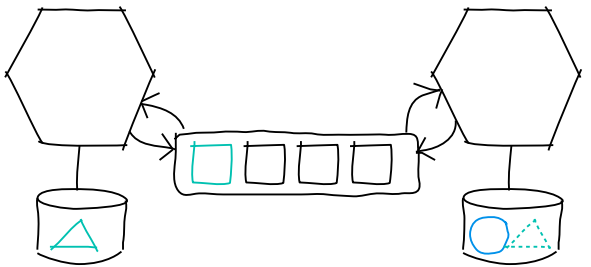
Event Streams as a Shared Source of Truth

Events for notification



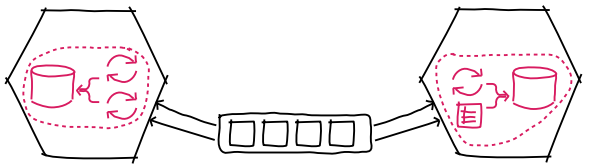
- Simple integration
- Remote query => increasing coupling

Events for data duplication



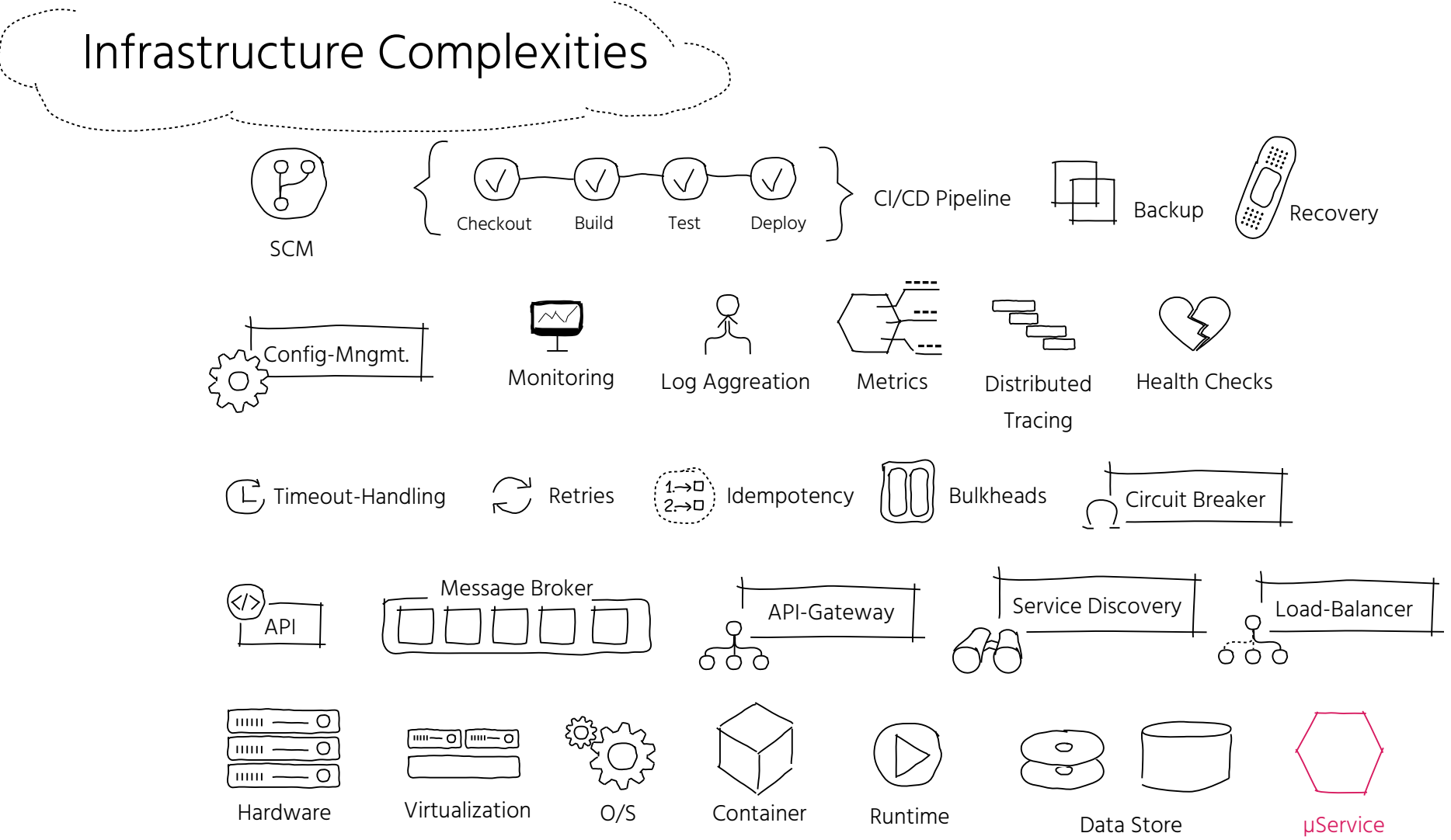
- Eliminating remote query => better decoupling
- Local copy => better autonomy
- Duplicating effort to maintain local dataset

Event streams as a shared source of truth

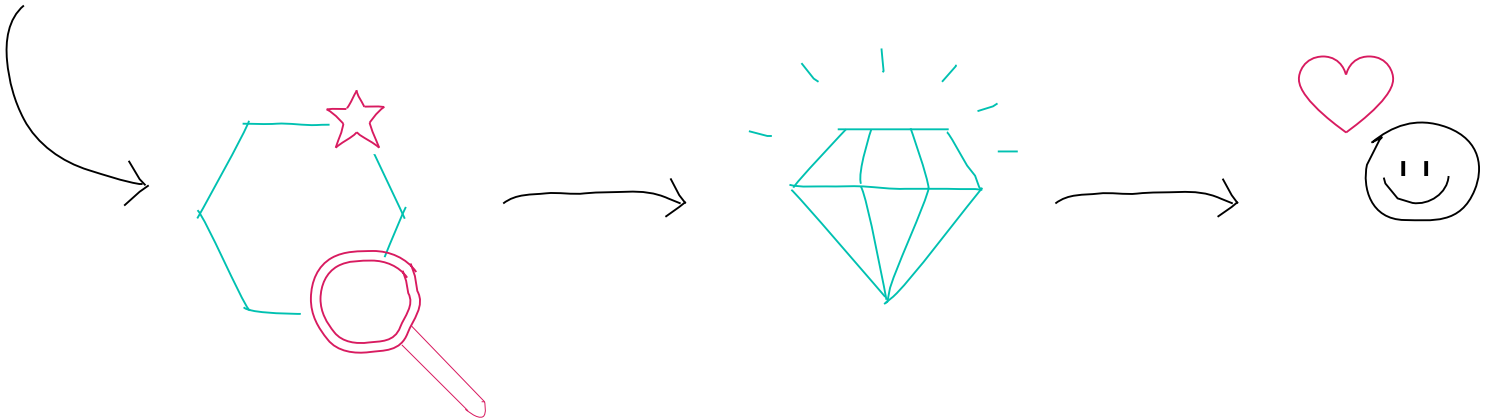


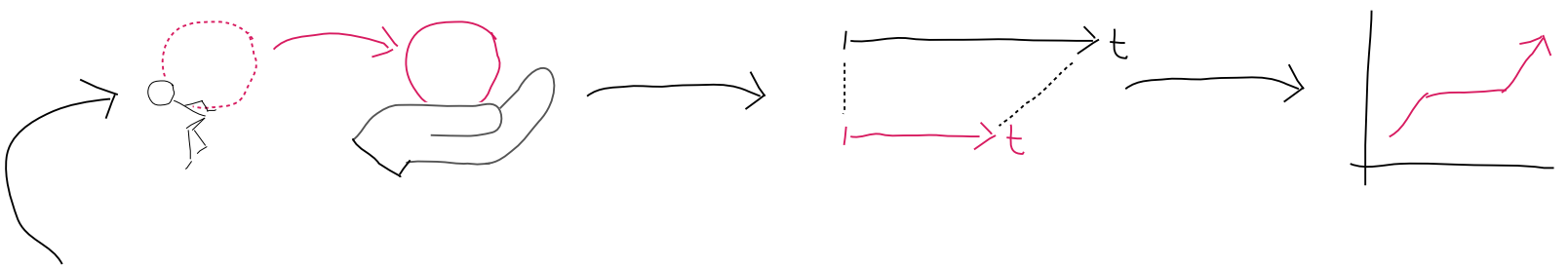
- Eliminating local copy => reduces duplicating effort
- Pushes data to where it's needed
- Increases pluggability
- Low barrier to entry for new service

Infrastructure Complexities



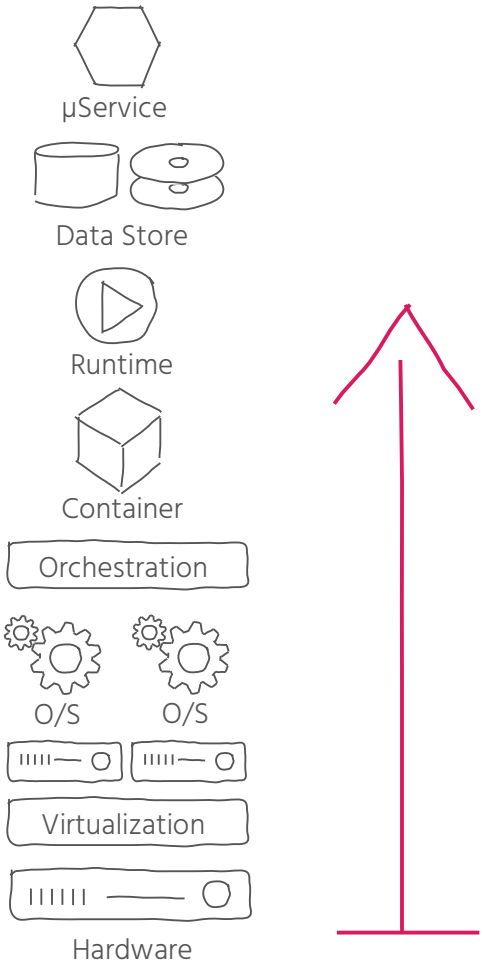
Build the things that differentiate you





Offload the things that don't

Managed Services

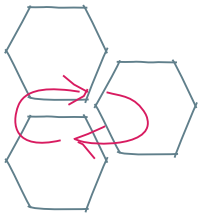


Offload by getting common building blocks managed by cloud providers

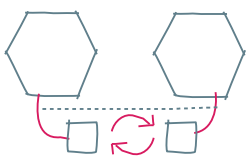
Lessons Learned

Start small

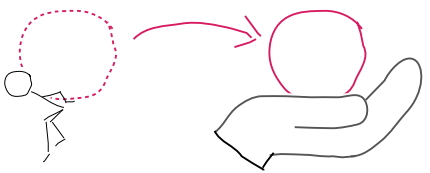
Handle cross-cutting concerns early



Avoid a distributed monolith

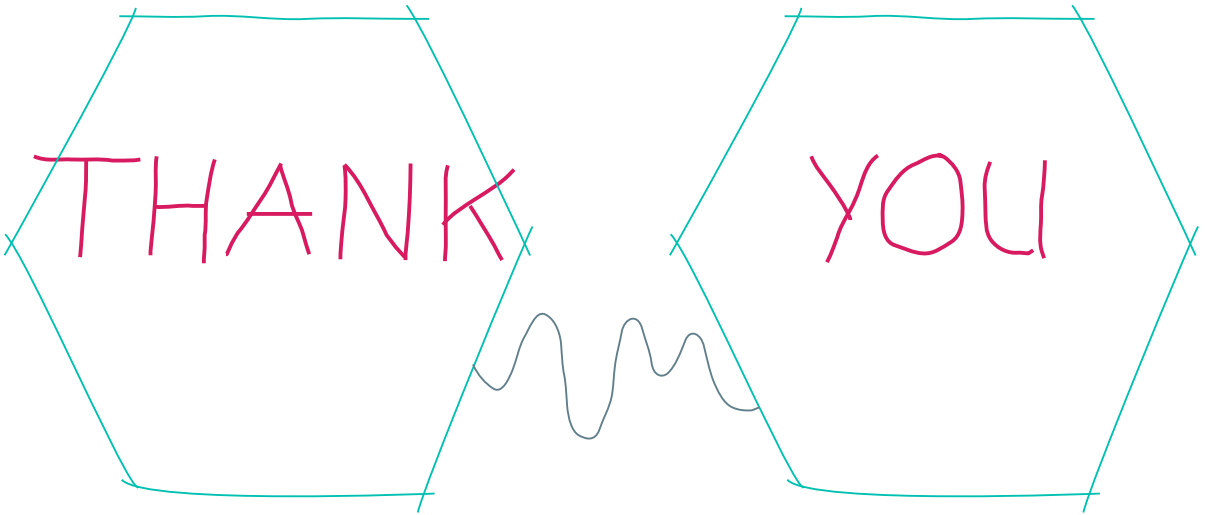


Design event-driven & consider
event streams as shared source of truth



Consider managed services to offload
infrastructure complexities

Be aware of affecting circumstances
&
Each journey is different :)



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