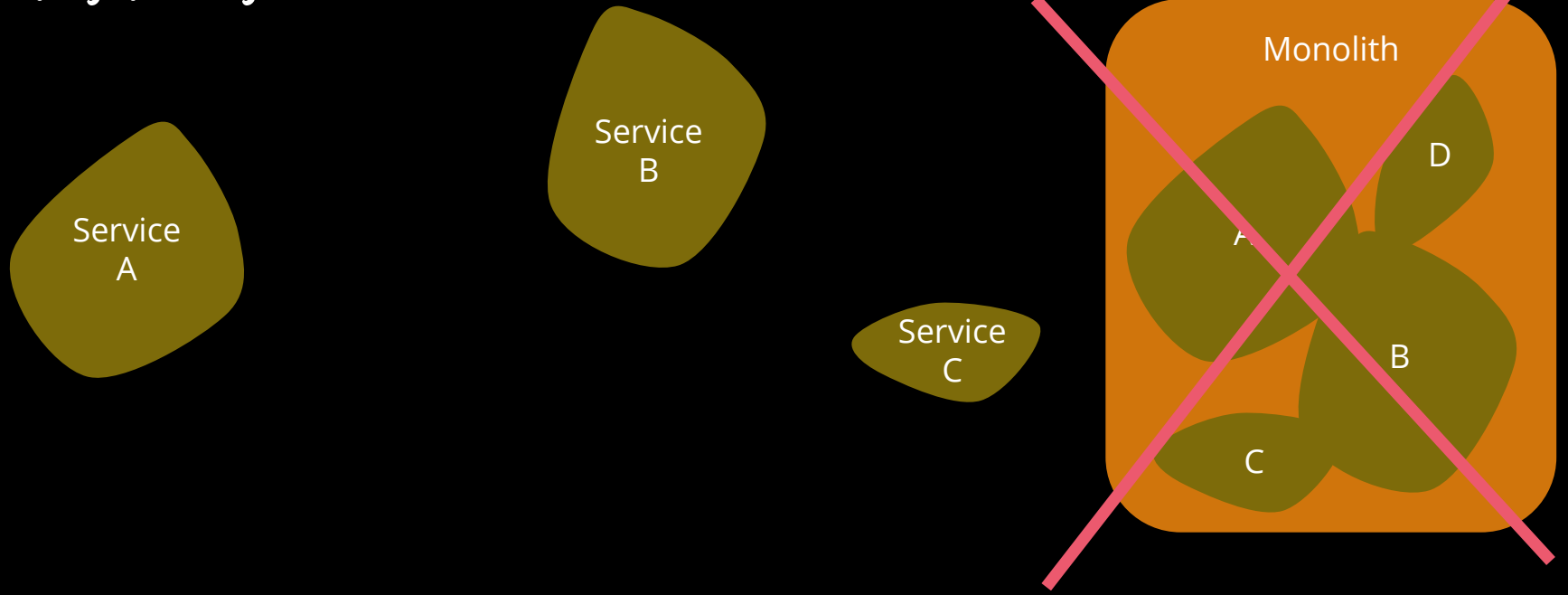
Microservices Orchestration and Integration using Workflow Automation

Bernd Ruecker

Co-Founder and Chief Technologist

Microservices

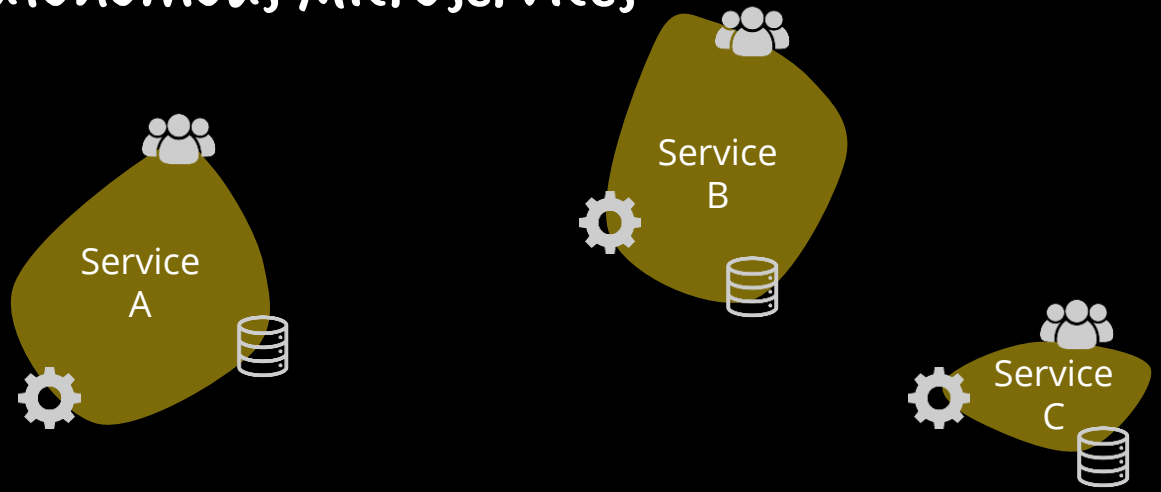


Change is the only constant

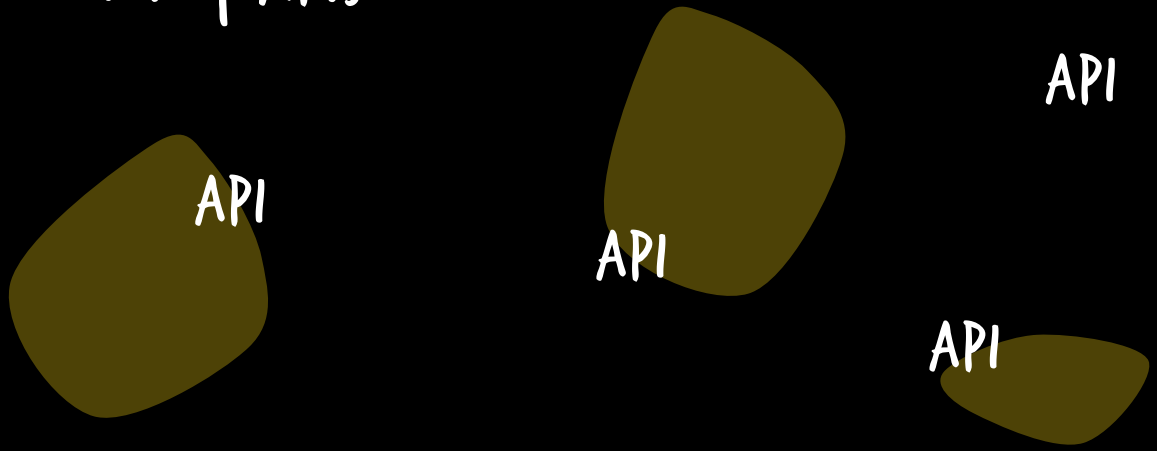
> We don't know what we will need tomorrow.
> But we do know that we will need something.
> We have to be able to move quickly!
>
> CIO of an insurance company in 2019

-> Agility

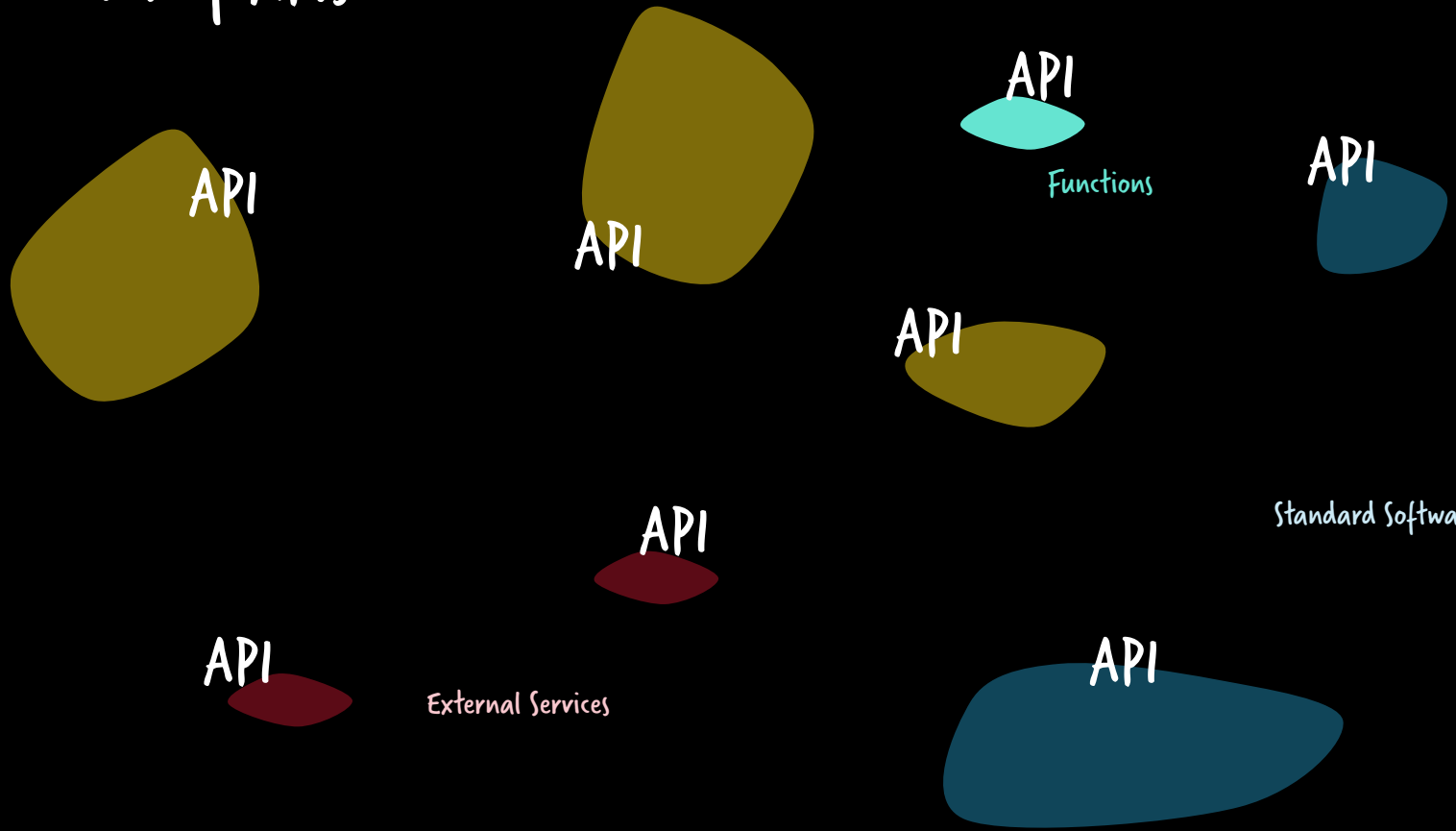
Autonomous Microservices



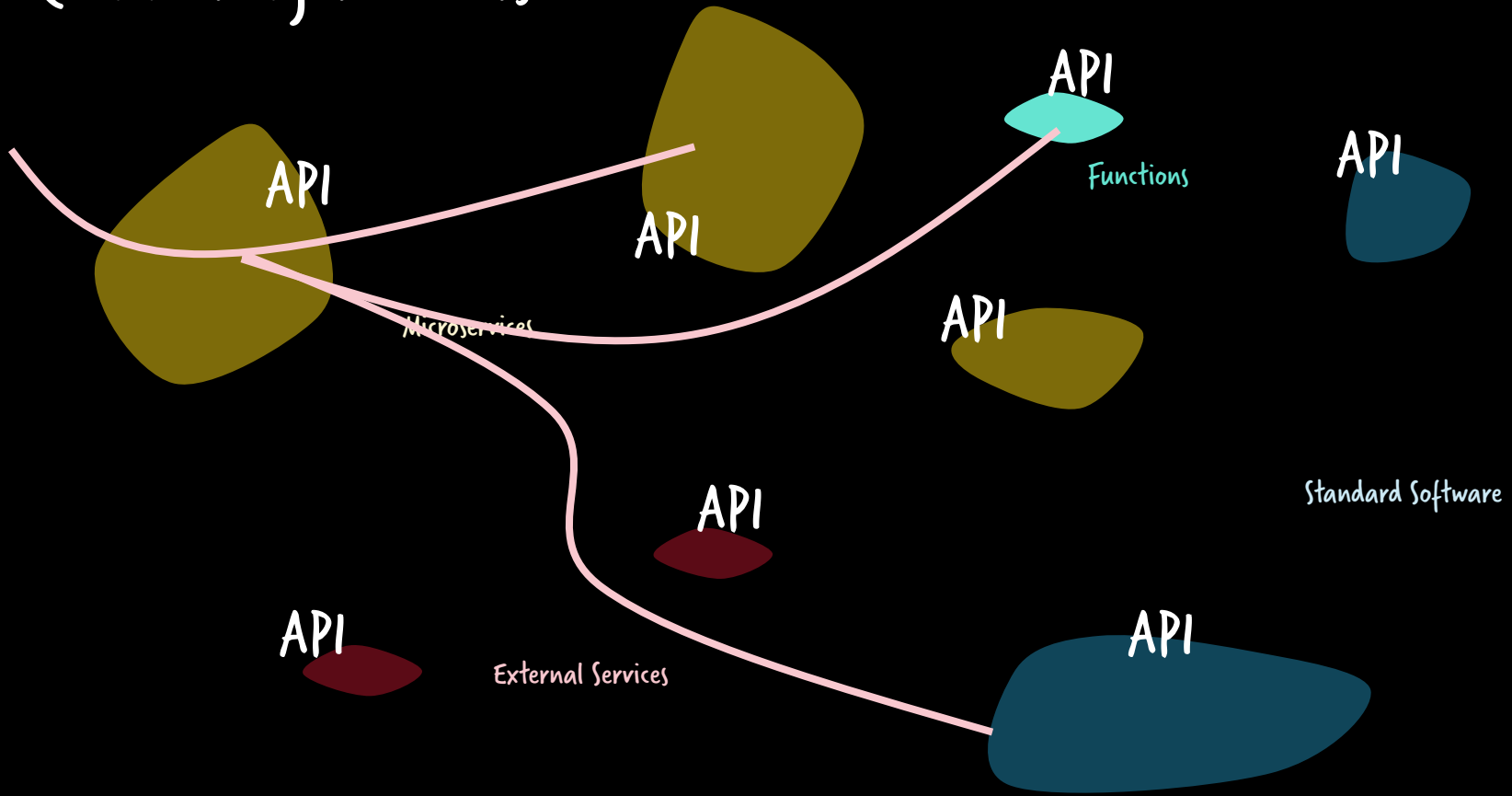
The era of APIs



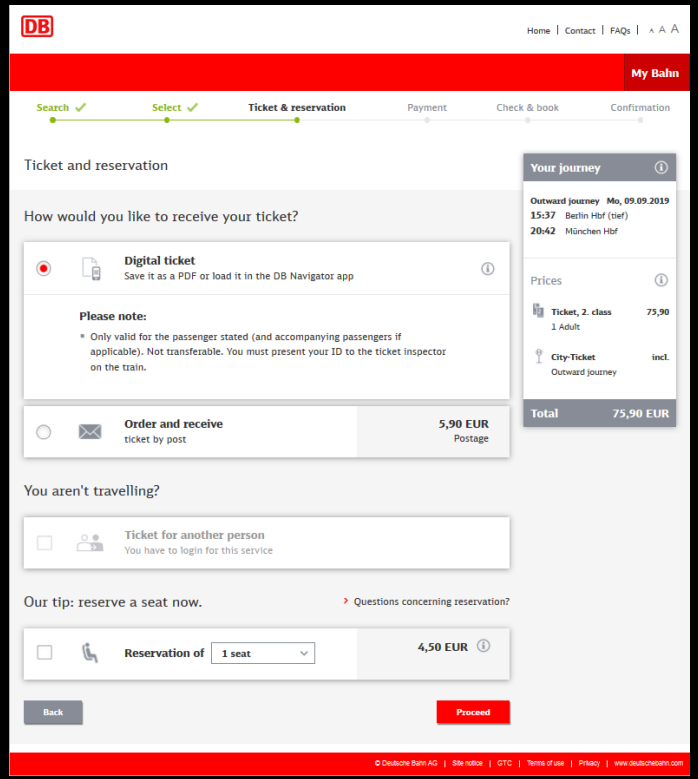
The era of APIs



Connecting the dots...



Example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You have to login for this service
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4,50 EUR
Back
Proceed
Your journey
Outward journey Mo, 09.09.2019
15:37 Berlin Hbf (tief)
20:42 München Hbf
Prices
Ticket, 2. class
1 Adult
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City-Ticket
Outward journey
incl.
Total
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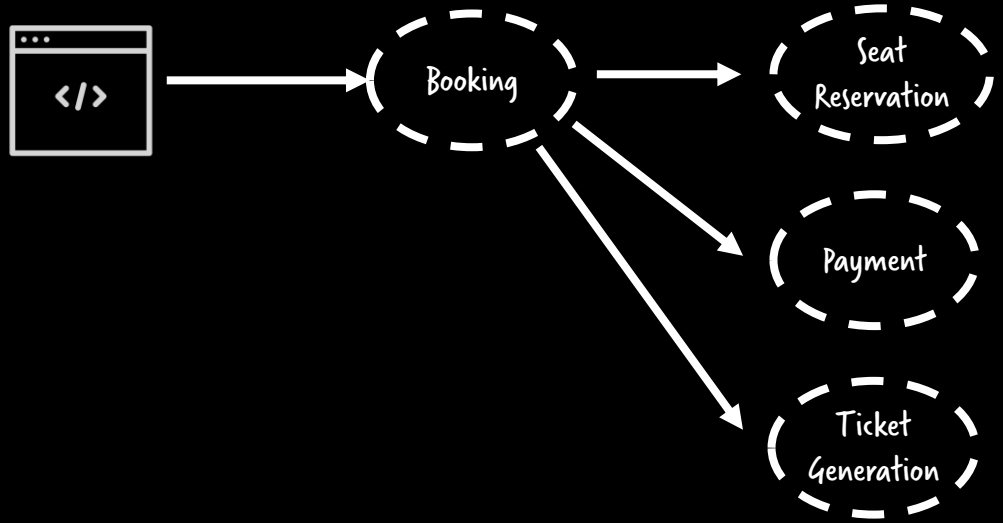
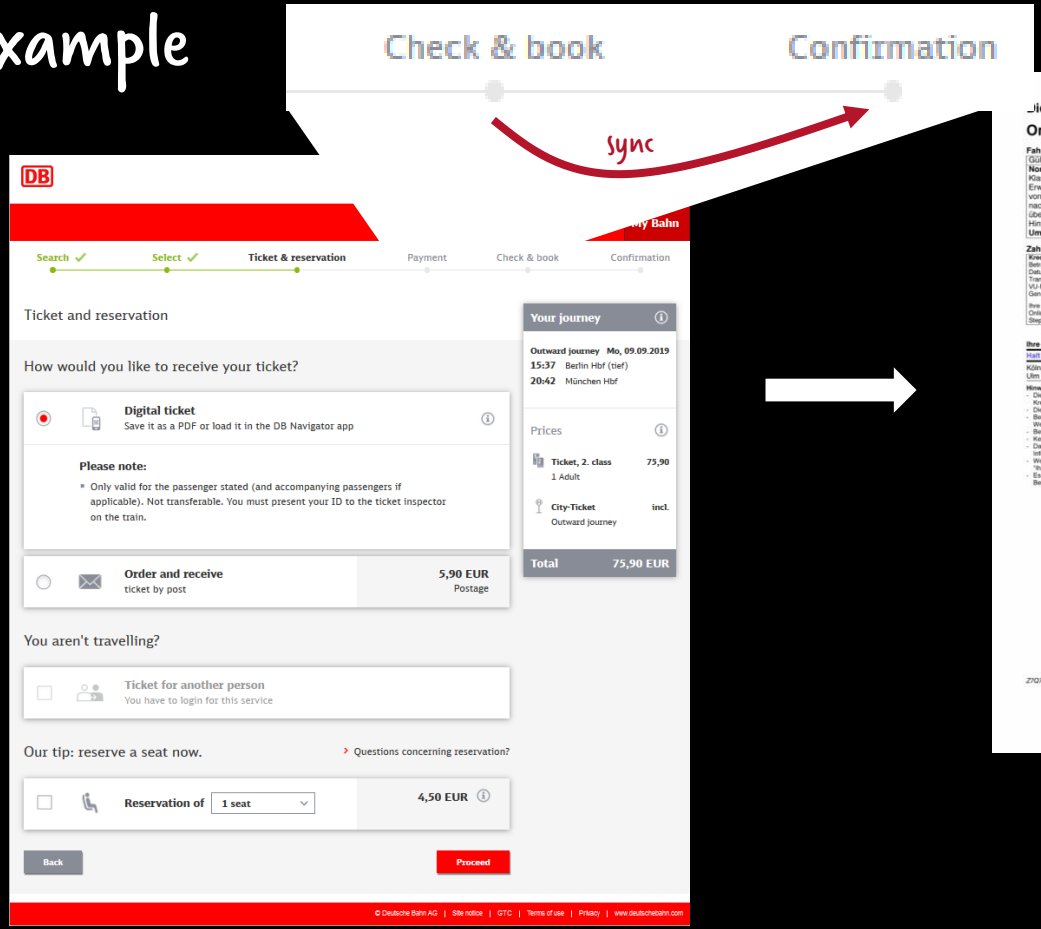
Ulm Hbf
ICE 519
siehe oben
Hinweise:
Wir danken Ihnen für Ihre Buchung und wünschen Ihnen eine angenehme Reise!

Example



Example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Normalpreis (Einfache Fahrt)
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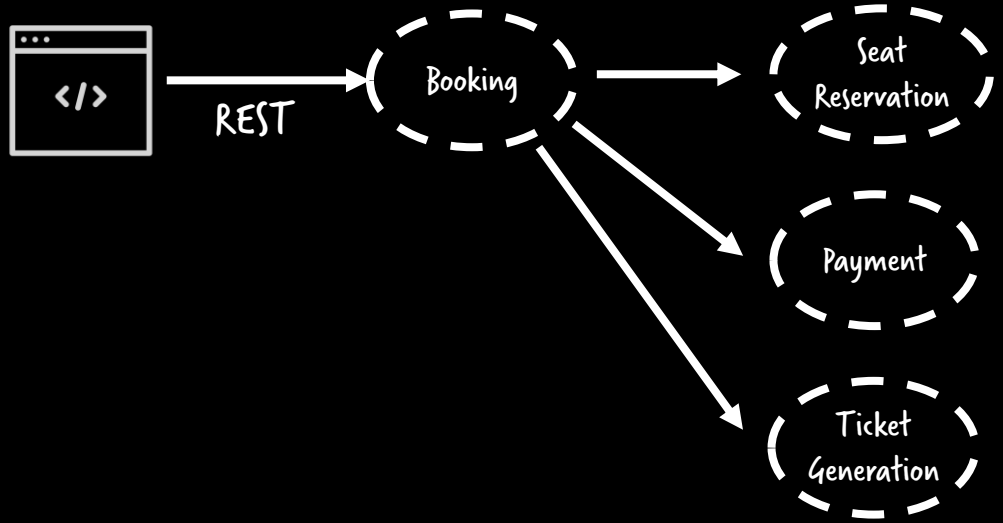
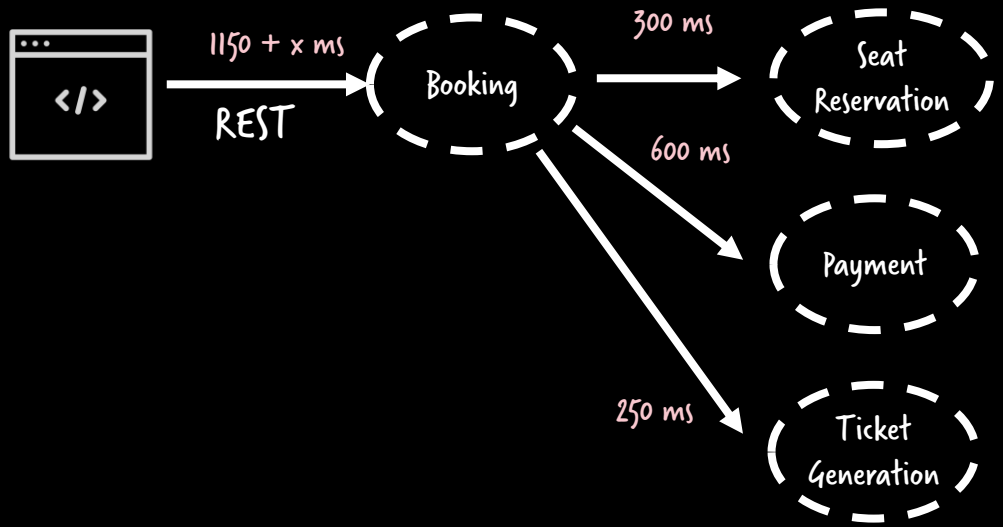
Hinweise:

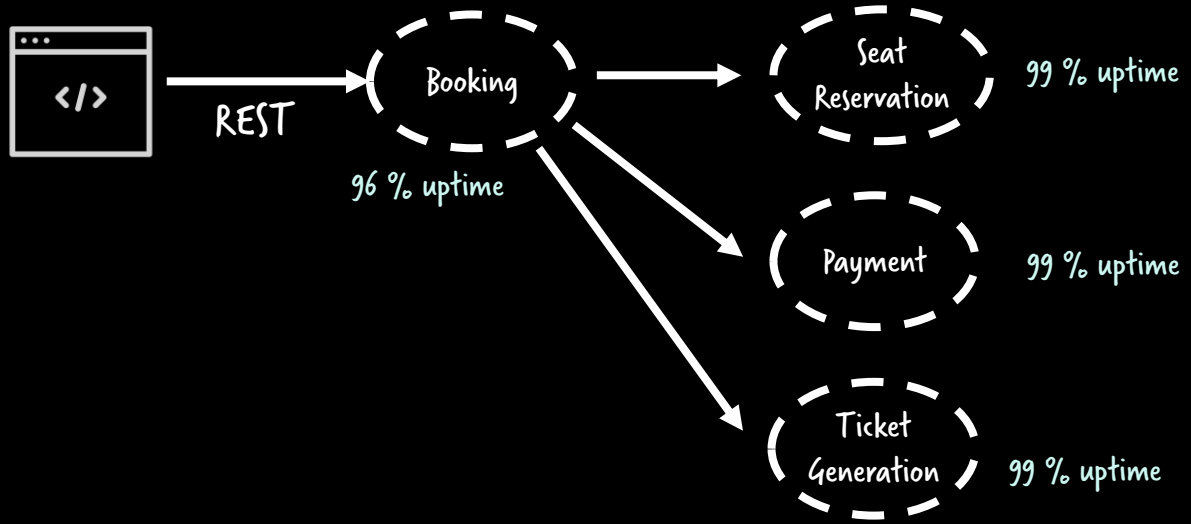
Weaknesses



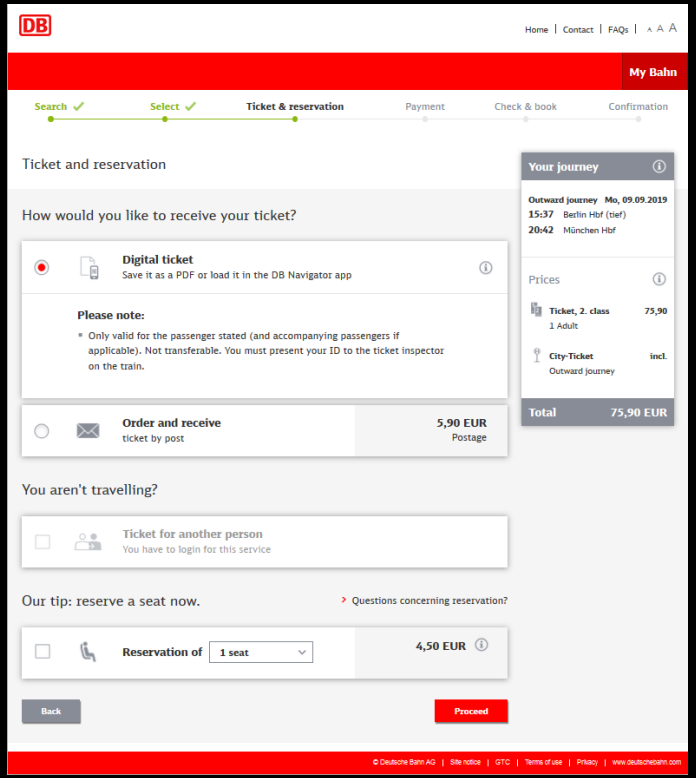
Weaknesses: Latency creep



Weaknesses: Availabiliy erosion



Example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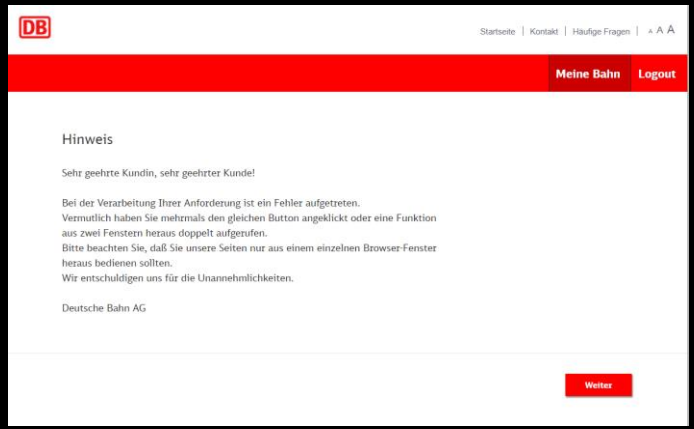
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Logout
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Vermutlich haben Sie mehrmals den gleichen Button angeklickt oder eine Funktion aus zwei Fenstern heraus doppelt aufgerufen.
Bitte beachten Sie, daß Sie unsere Seiten nur aus einem einzelnen Browser-Fenster heraus bedienen sollten.
Wir entschuldigen uns für die Unannehmlichkeiten.
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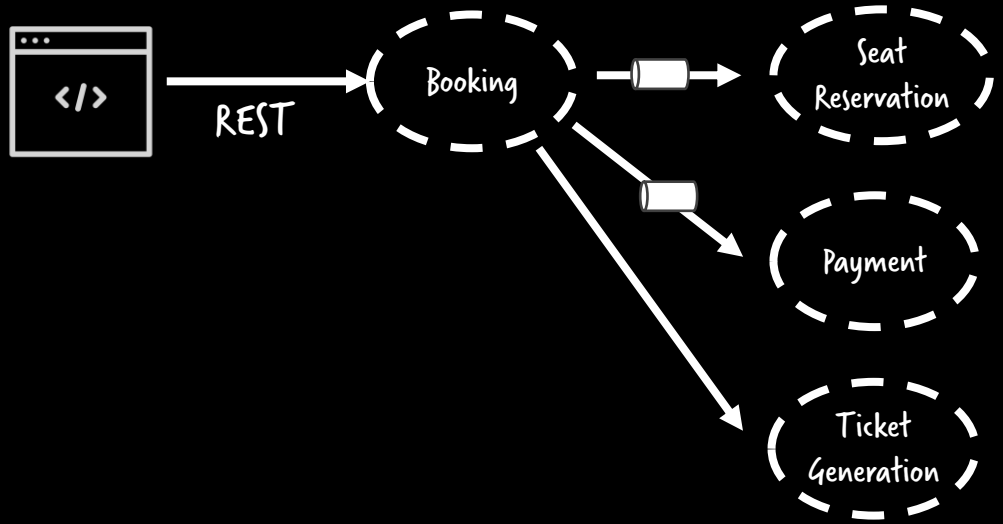
Weiter

And it is even hard to implement



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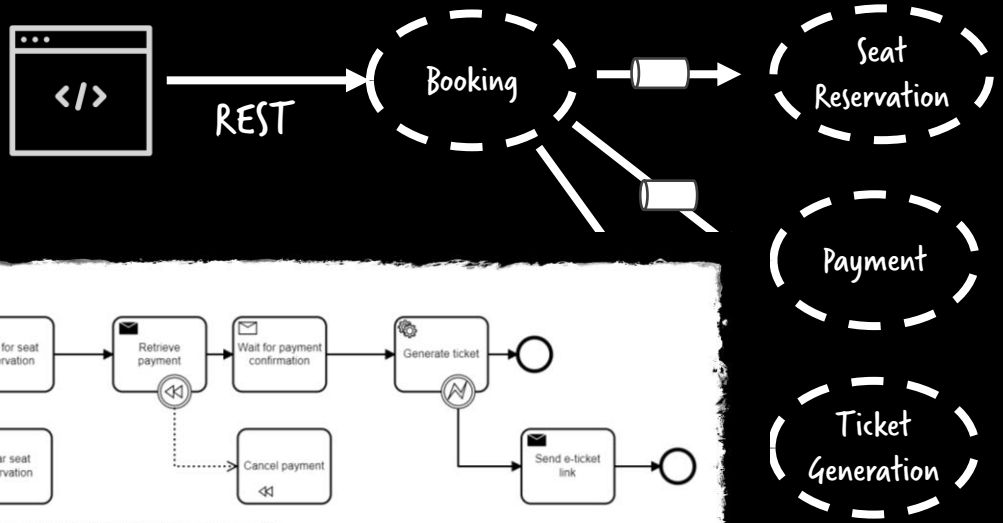
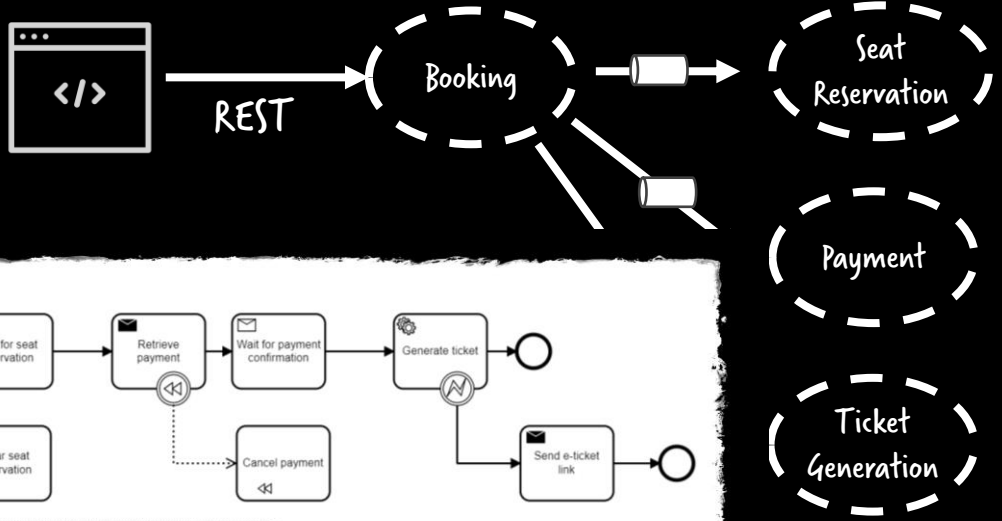
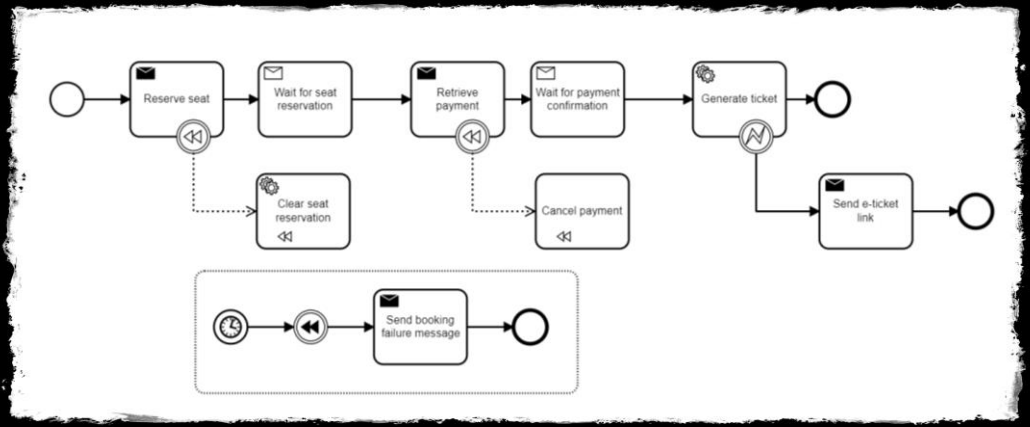


Workflow automation can help



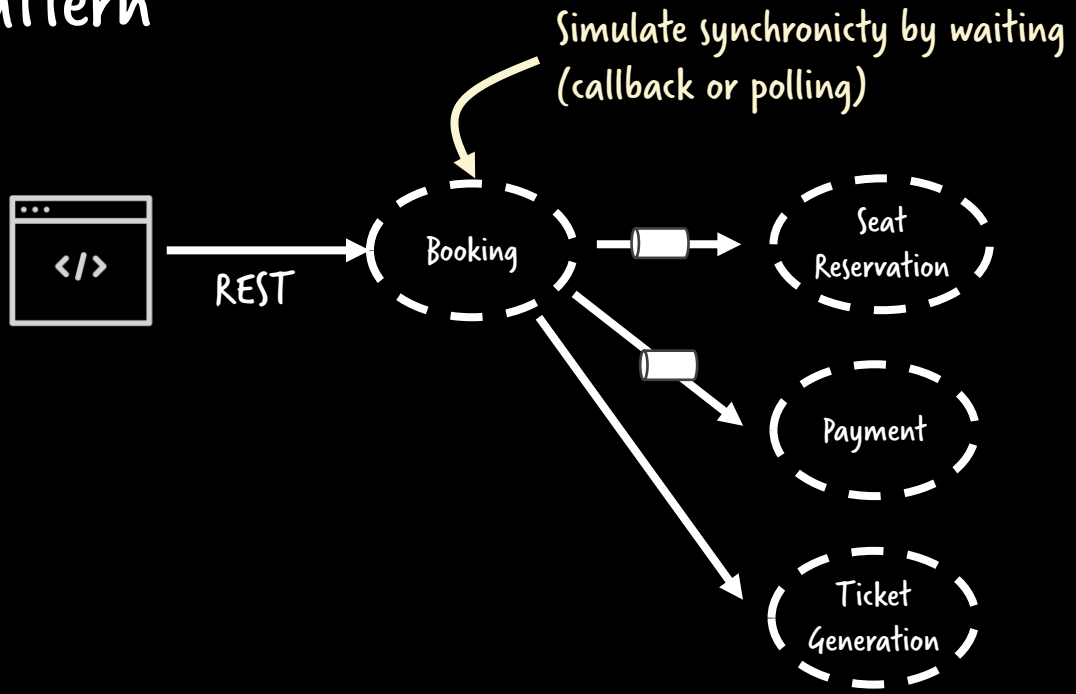


Workflow Automation:

Is stateful

Can wait
Can retry
Can escalate
Can compensate

Typical pattern

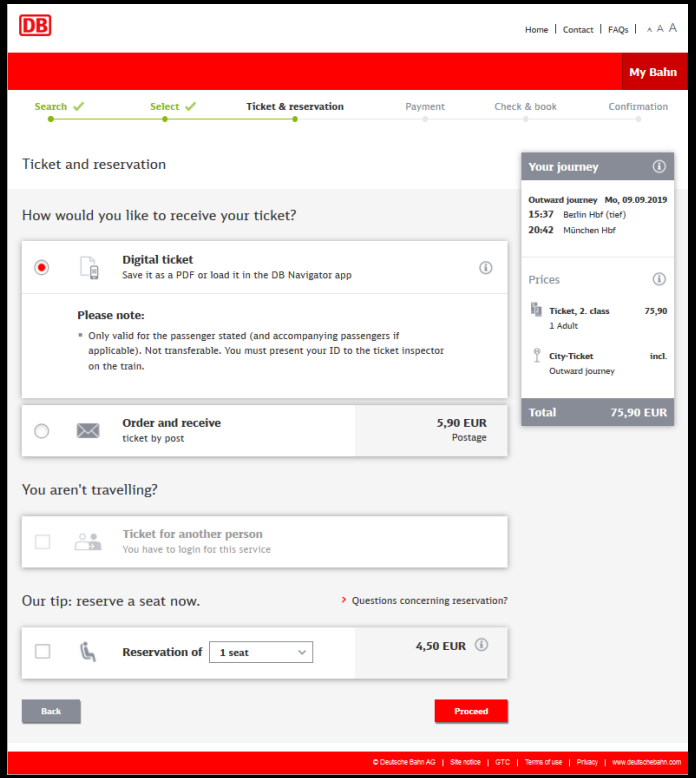


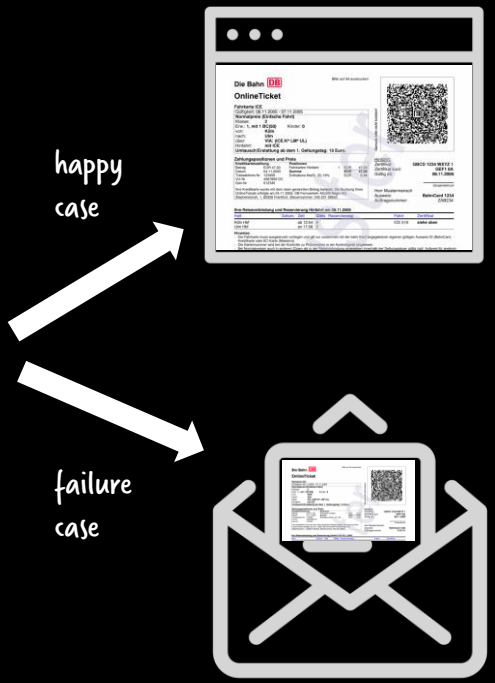
Can your company leverage your hipster architecture?

You need to change **business processes** and **customer experience**!

Shutterstock

Redesign your business process accordingly!



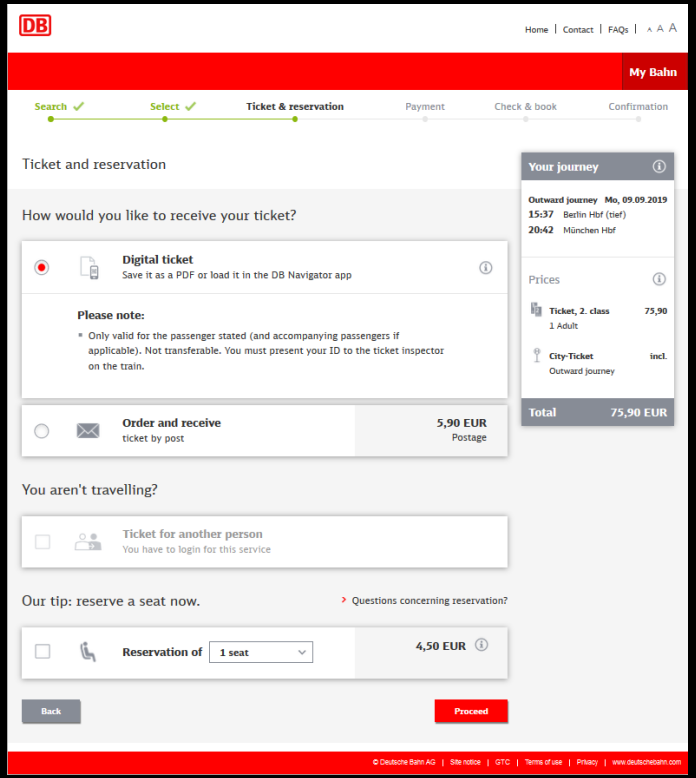


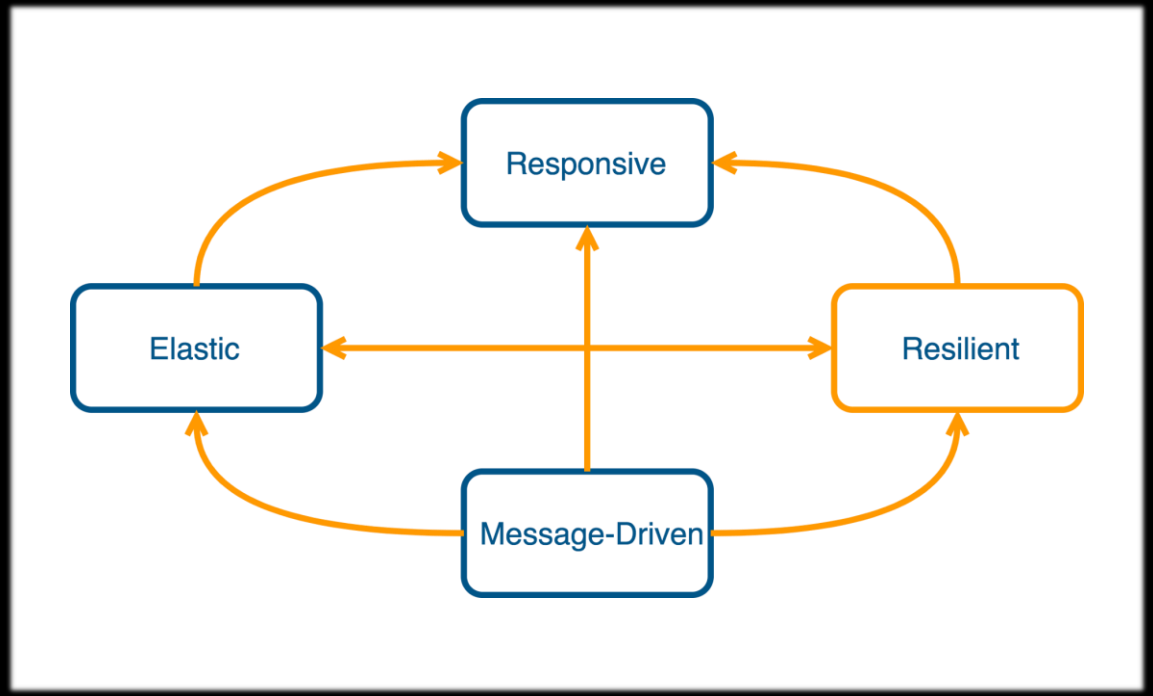
Sync in happy case

Or some interface to poll for status

Async response

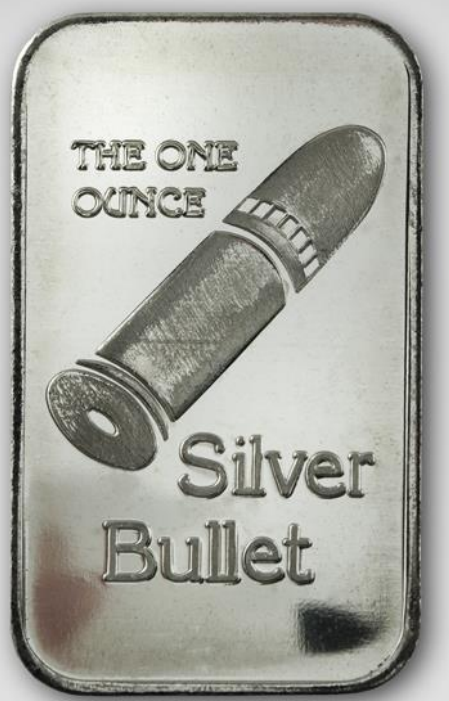
Redesign your business process accordingly!

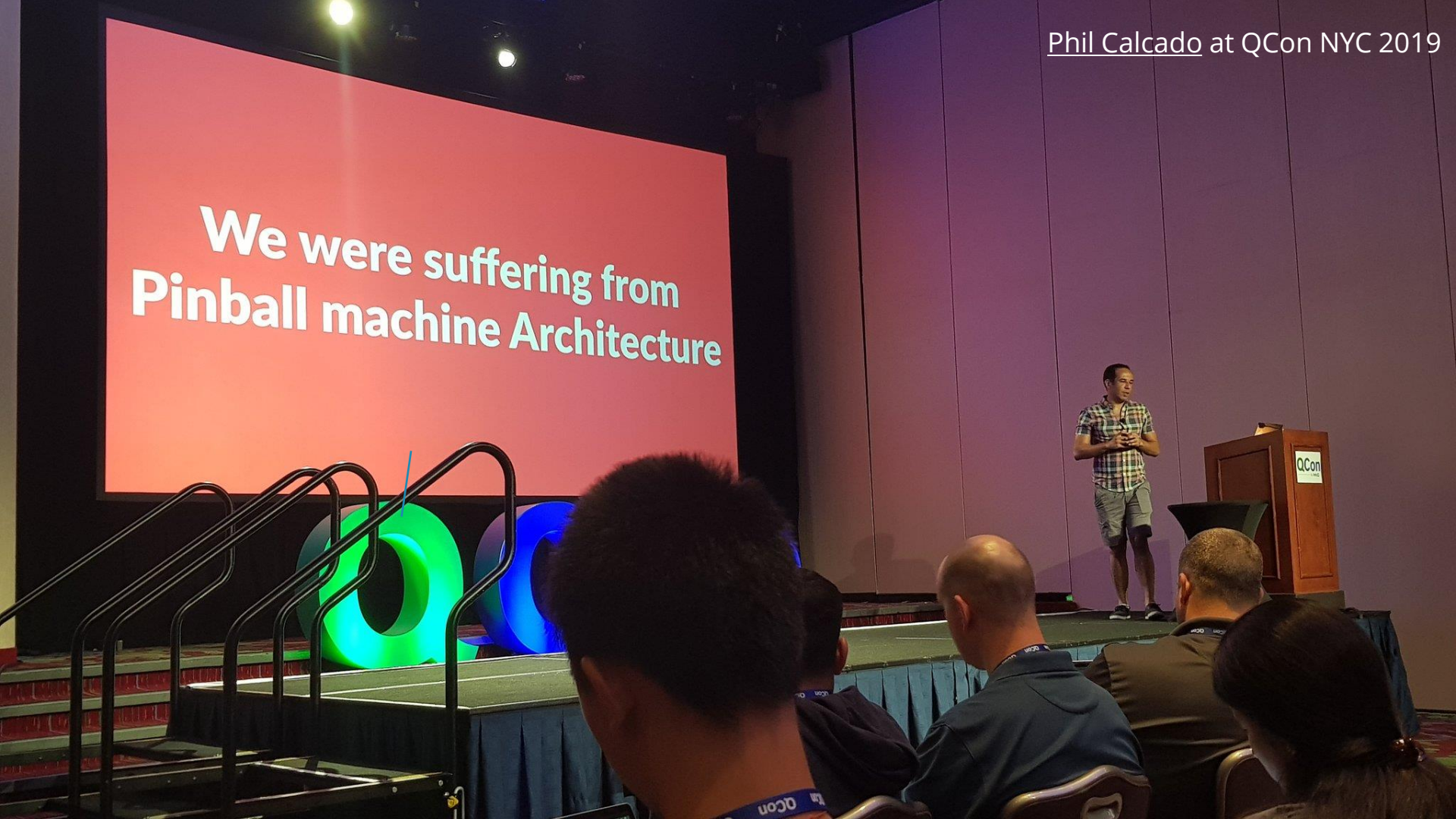




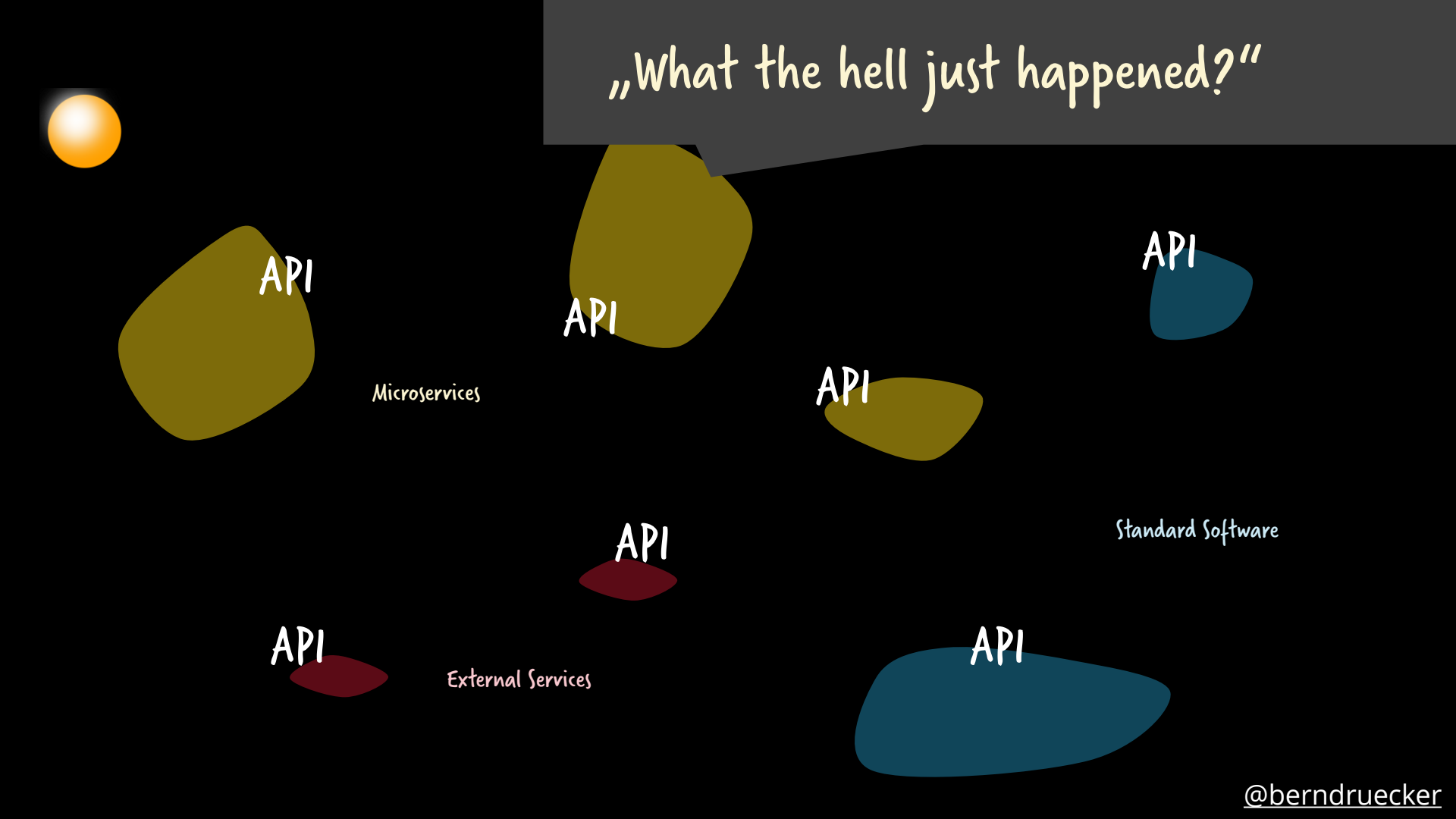
https://www.reactivemanifesto.org/

Yeah!
Let's go reactive.





Phil Calcado at QCon NYC 2019


„What the hell just happened?“
API
API
API
API
Microservices
API
Standard Software
API
API
External Services
@berndruecker

Example: order fulfillment via dash button

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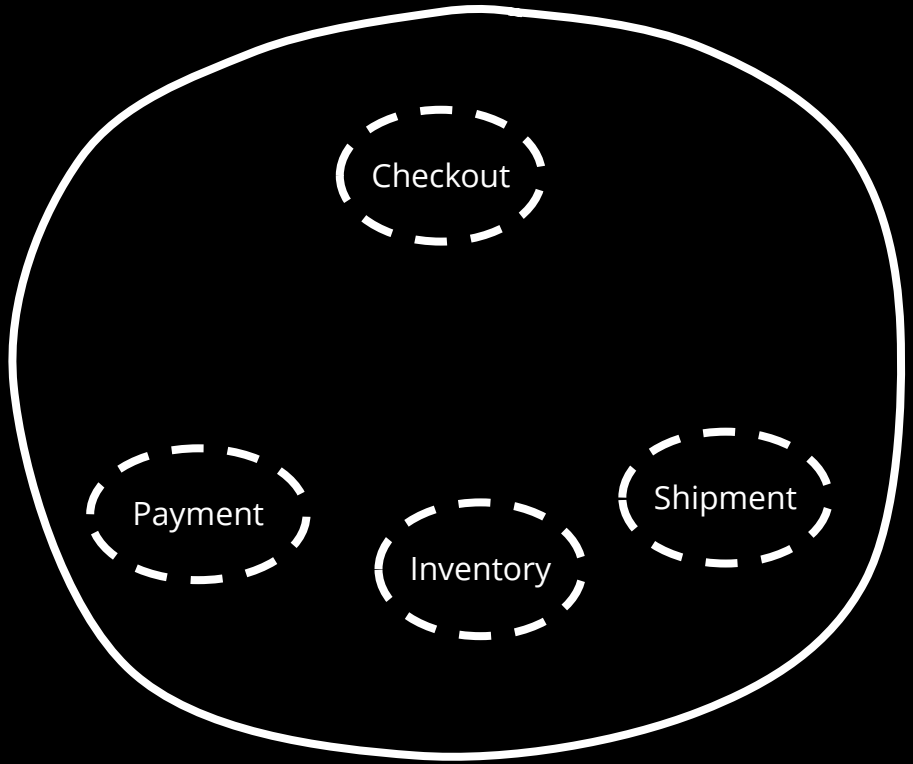
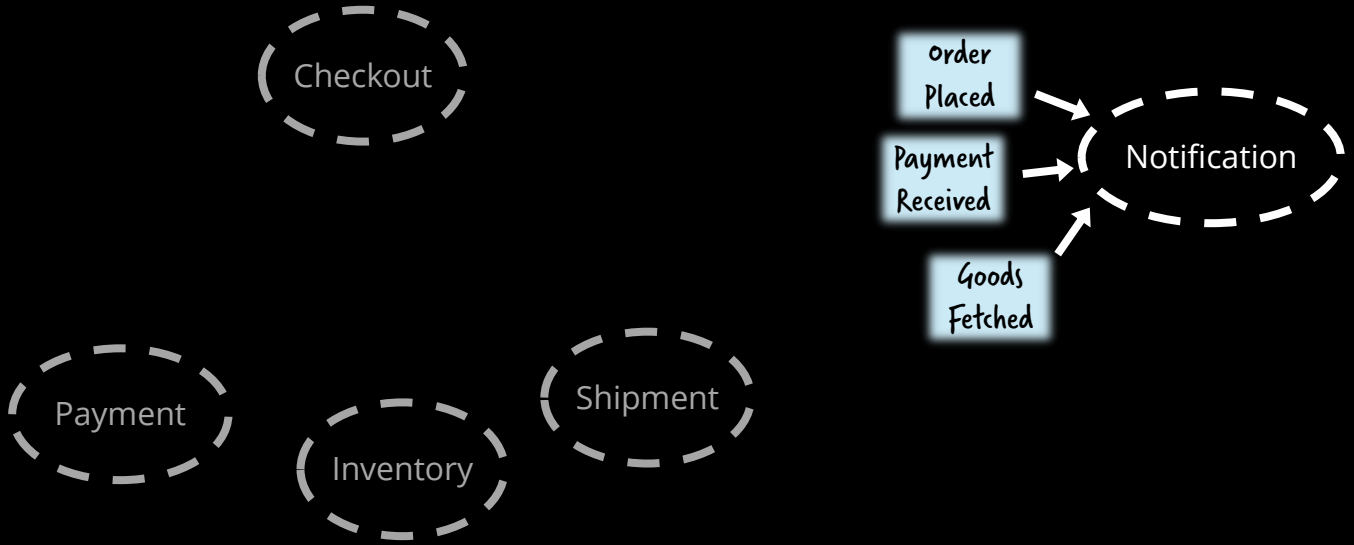
Three steps...

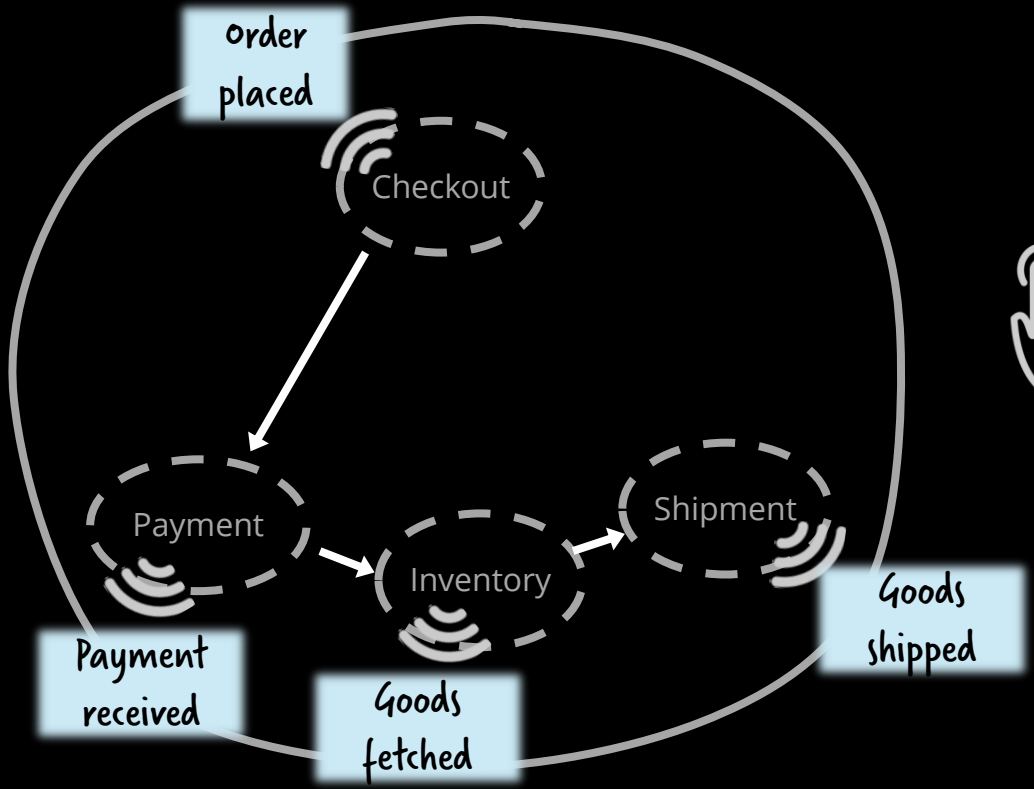
(Micro-)services



Event-driven architecture



Peer-to-peer event chains



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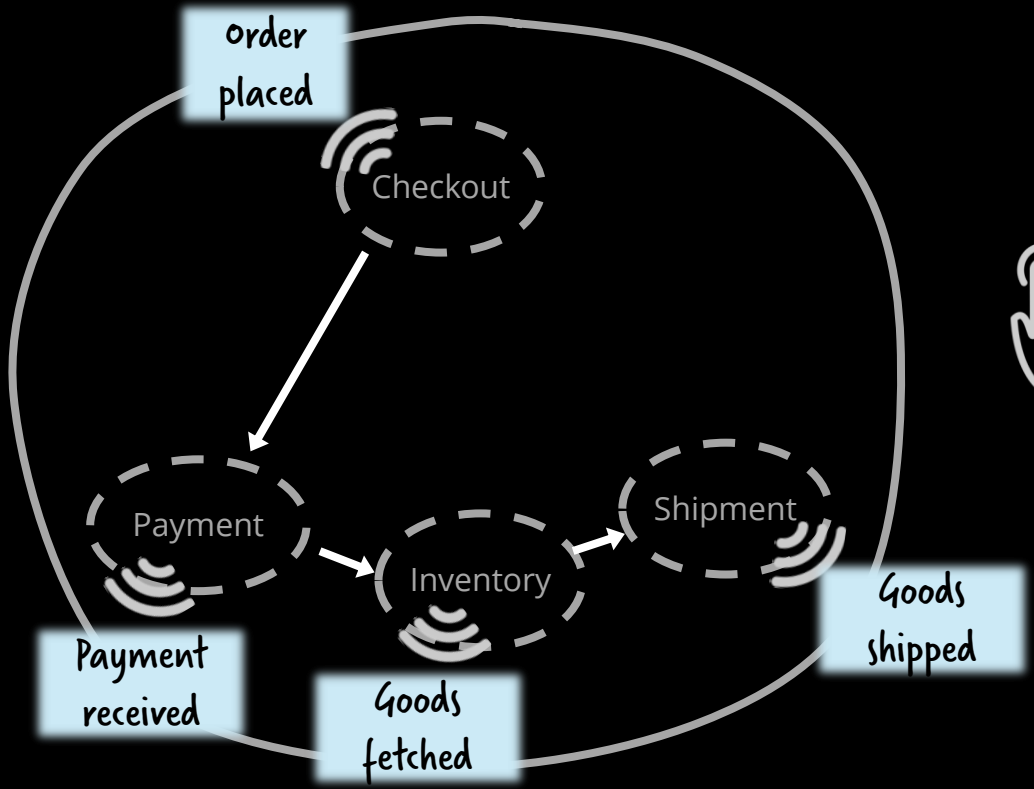

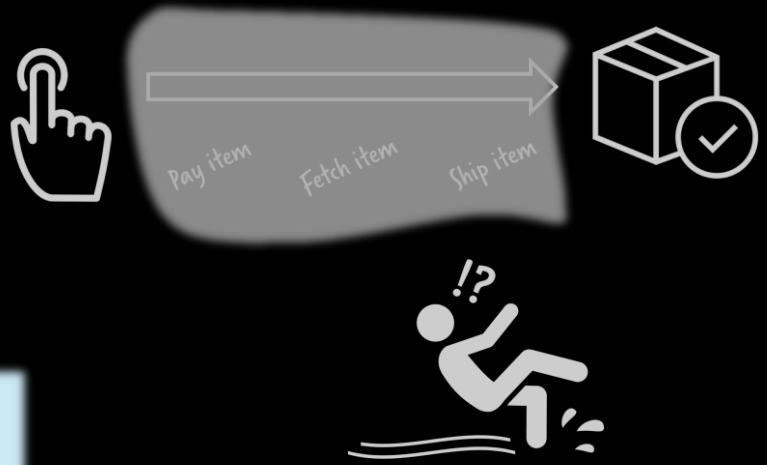

The danger is that it's very easy to make nicely decoupled systems with event notification, without realizing that you're losing sight of that larger-scale flow, and thus set yourself up for trouble in future years.

https://martinfowler.com/articles/201701-event-driven.html

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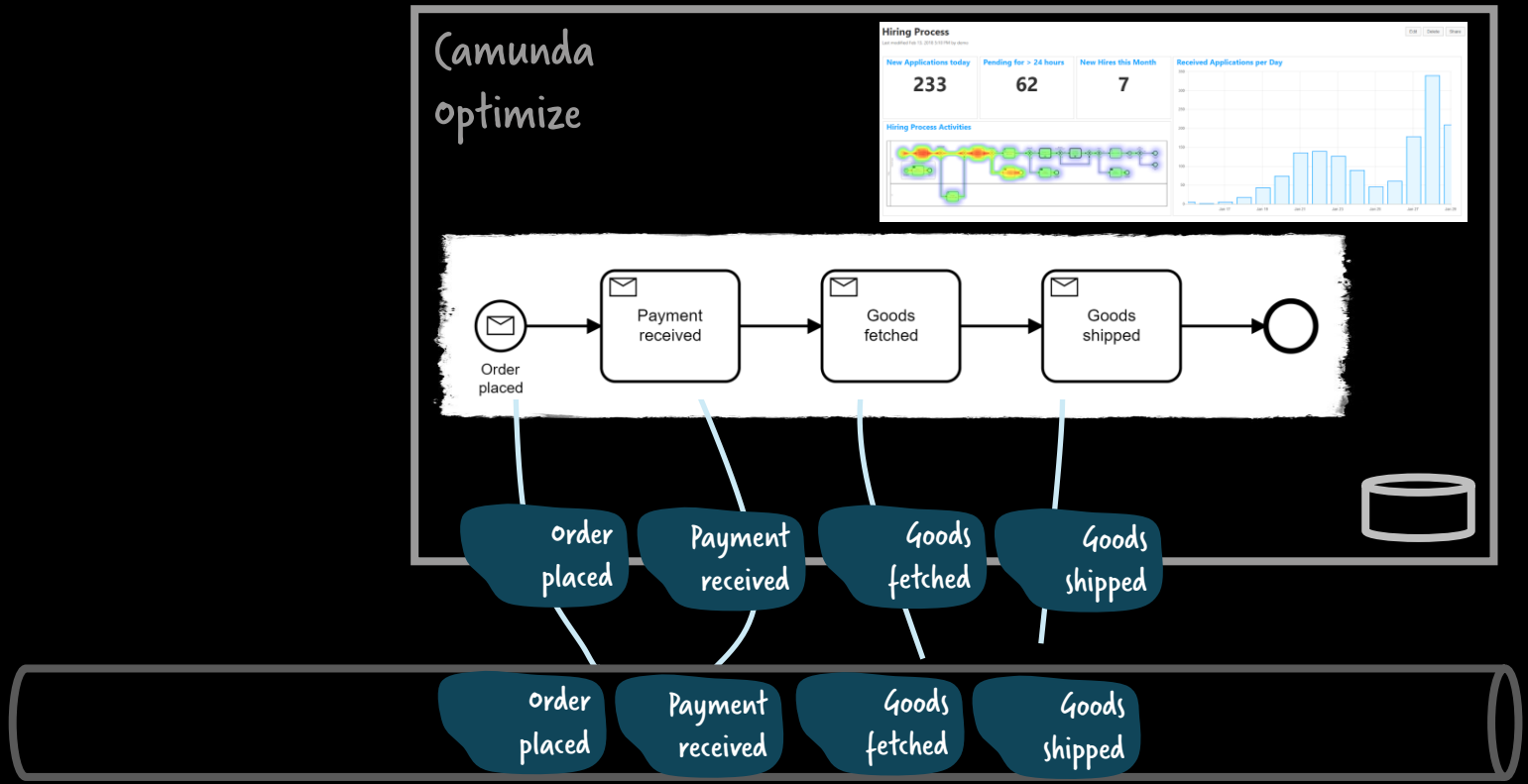
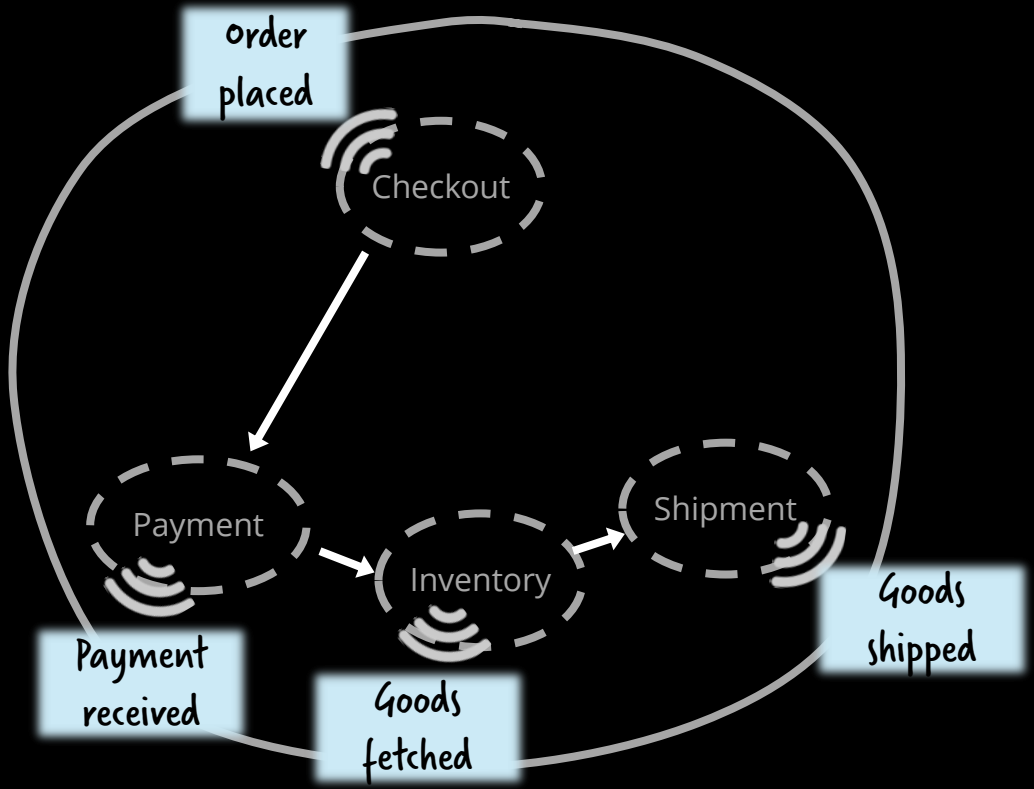
https://martinfowler.com/articles/201701-event-driven.html

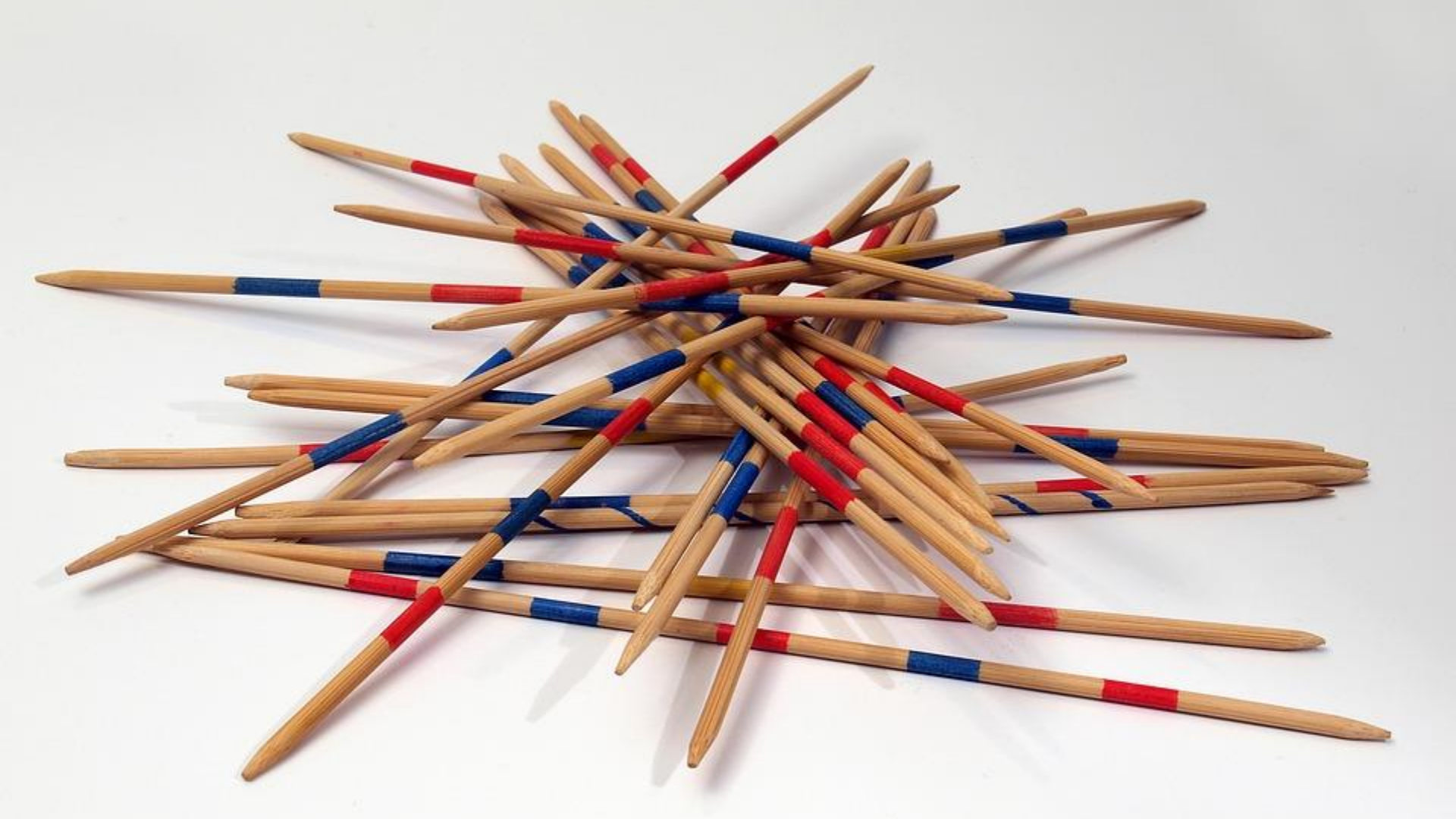
Process Events Monitoring



Demo

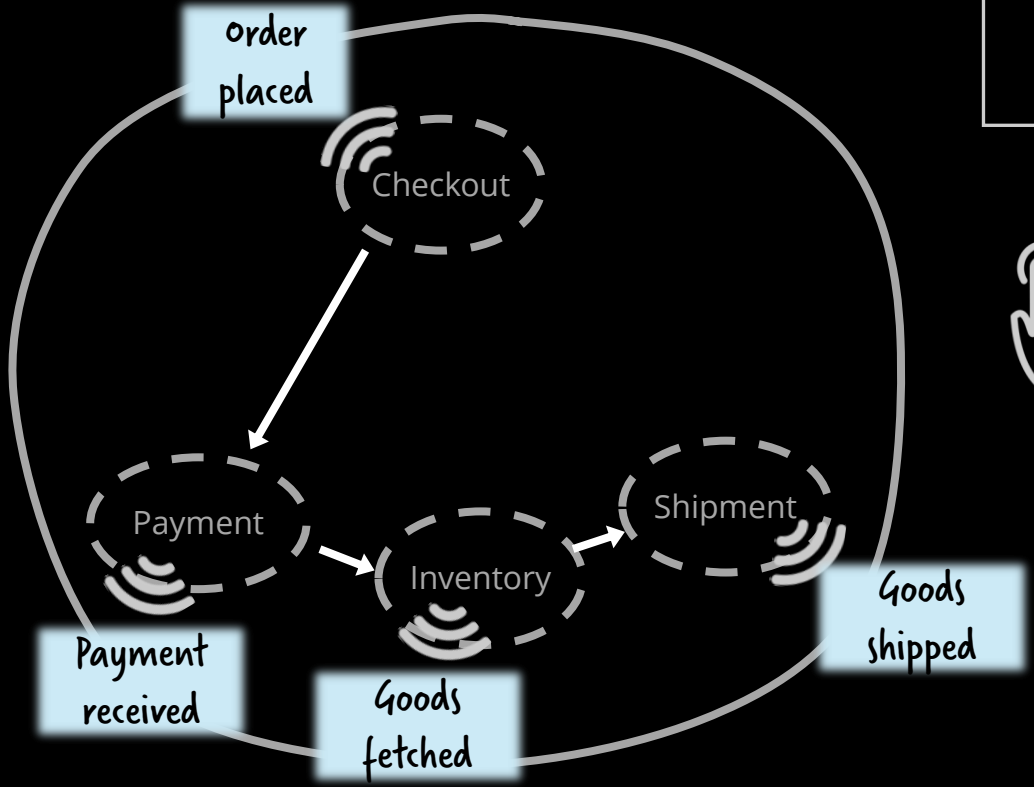
Peer-to-peer event chains

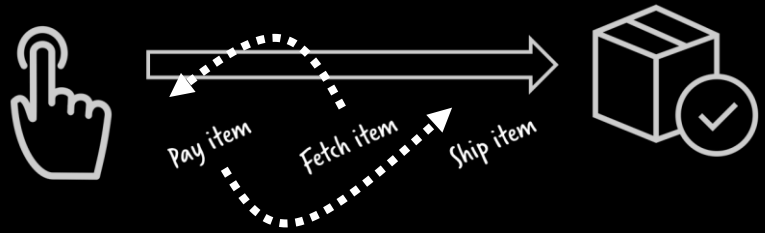




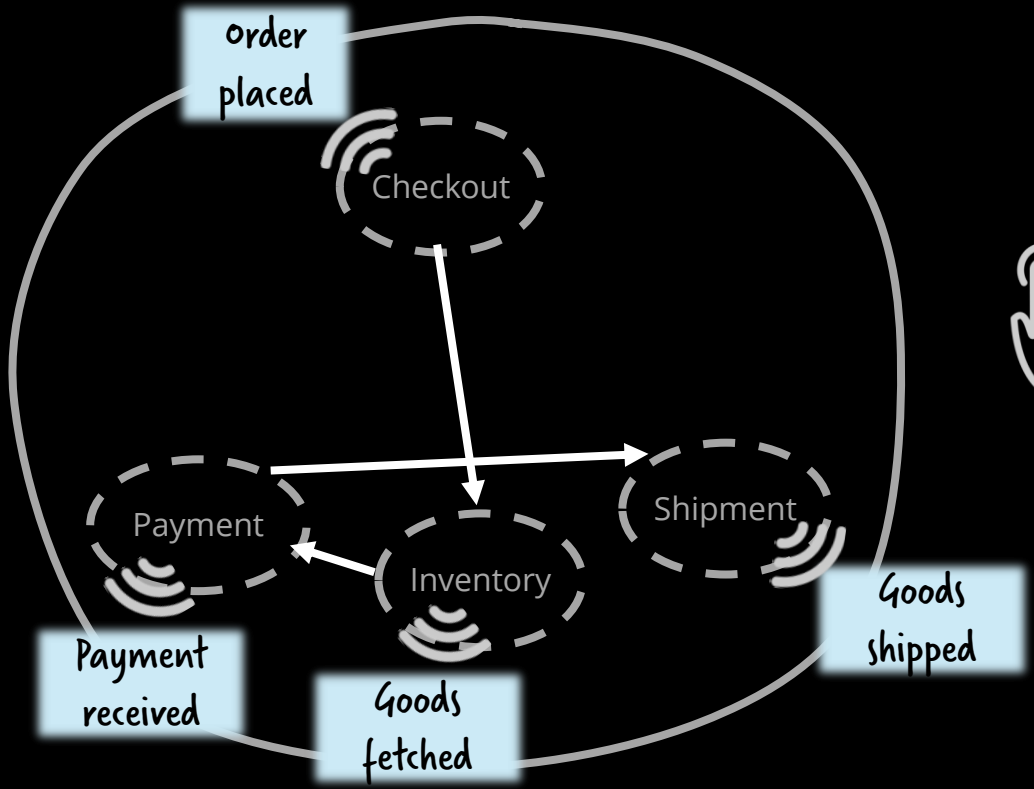
Peer-to-peer event chains

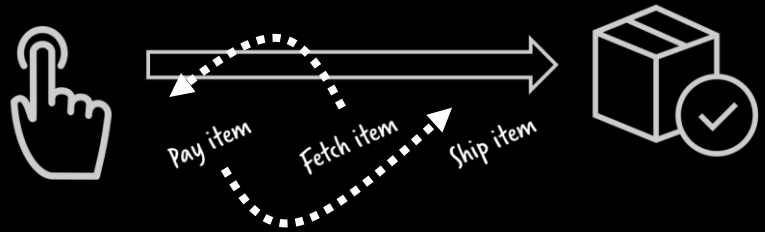
Fetch the goods **before** the payment





Peer-to-peer event chains





What we wanted

vs. what we got

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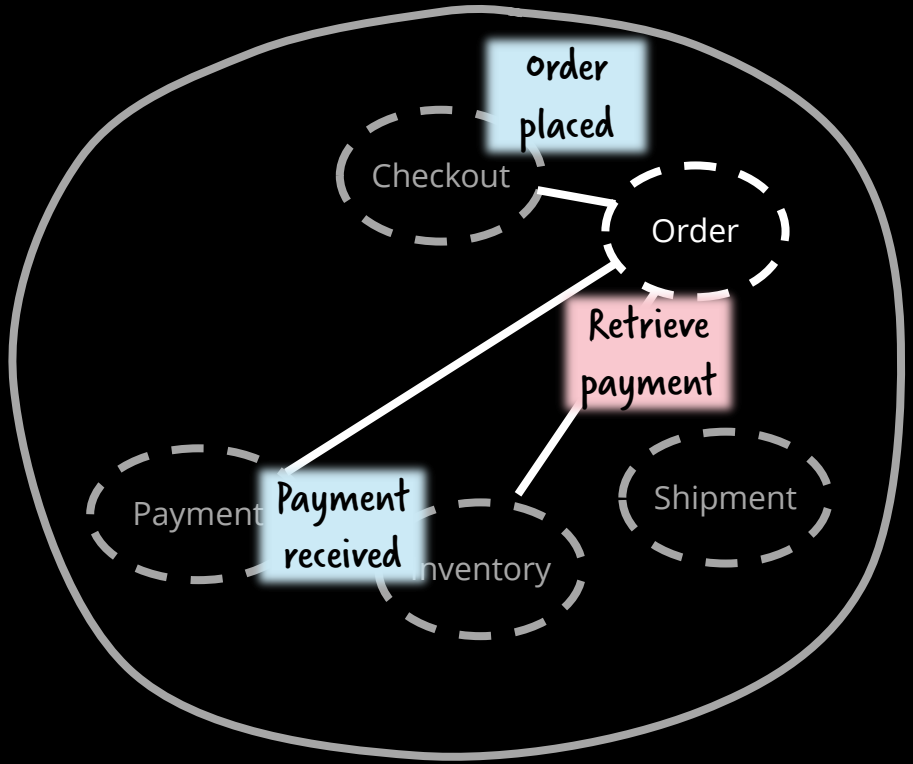
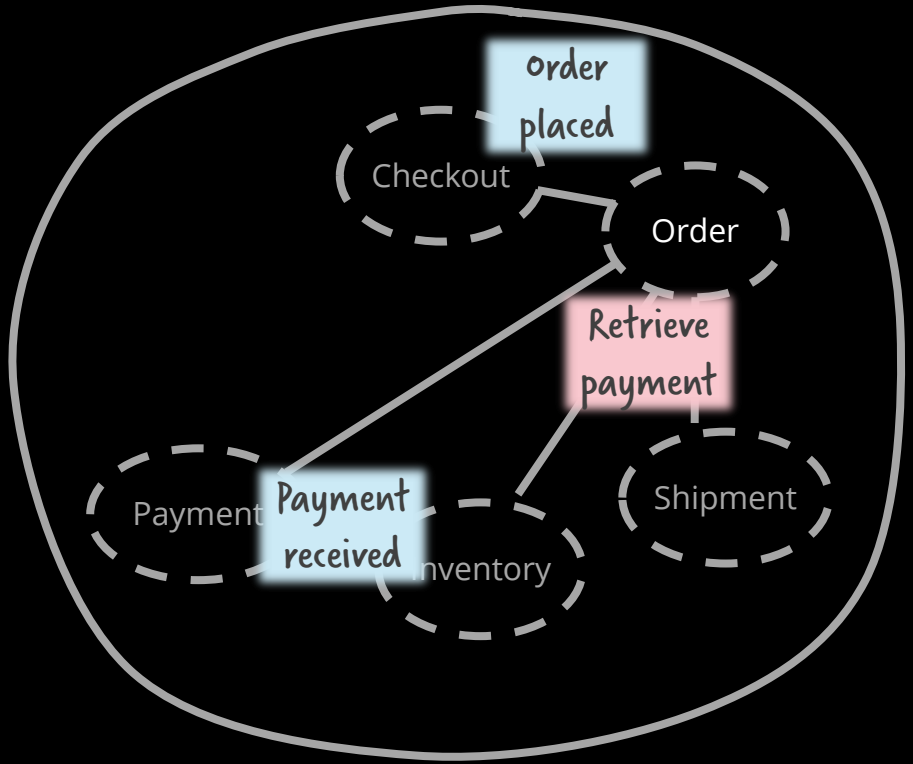
Extract the end-to-end responsibility



Events & Commands



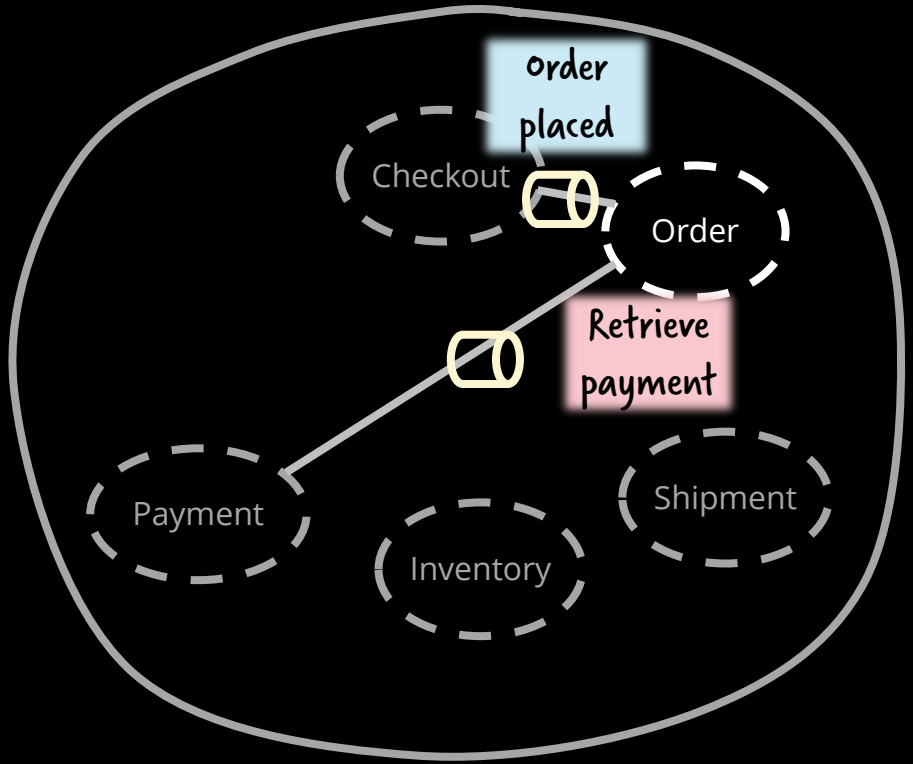
Event

Fact,
happened in the past,
immutable

Command

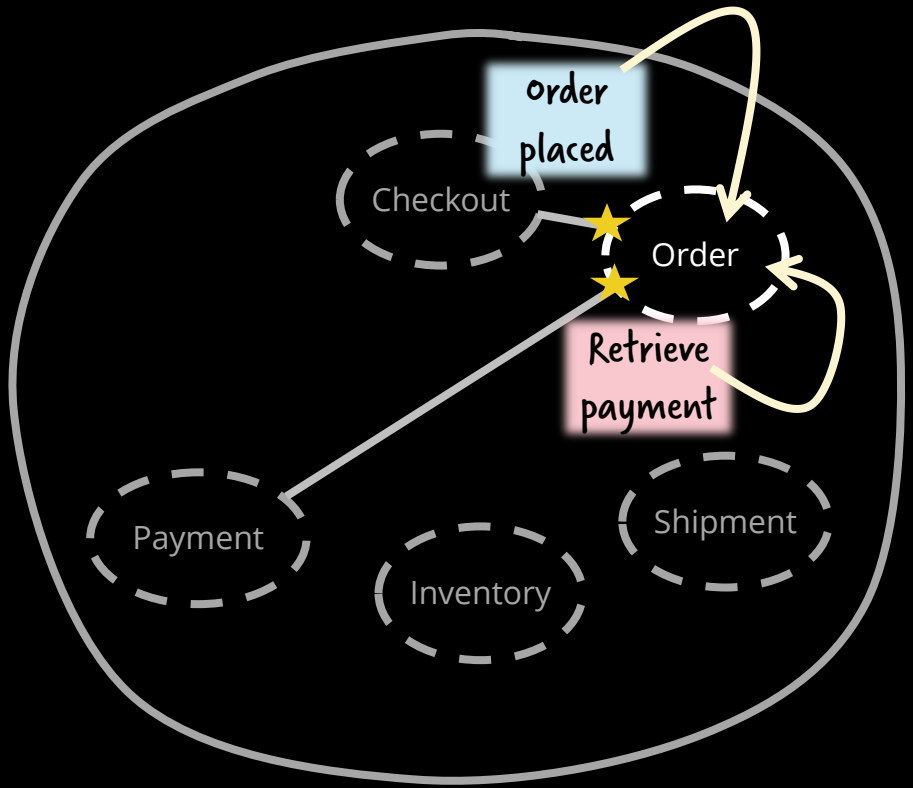
Intend,
Want s.th. to happen

It is not about the protocol!



It can still be messaging!

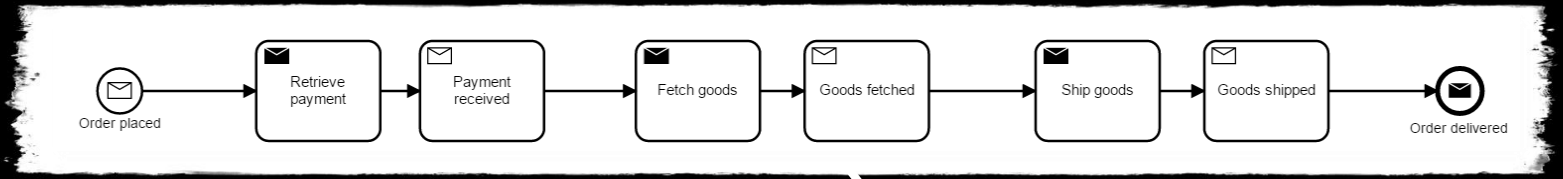
It is about where to decide about the coupling!

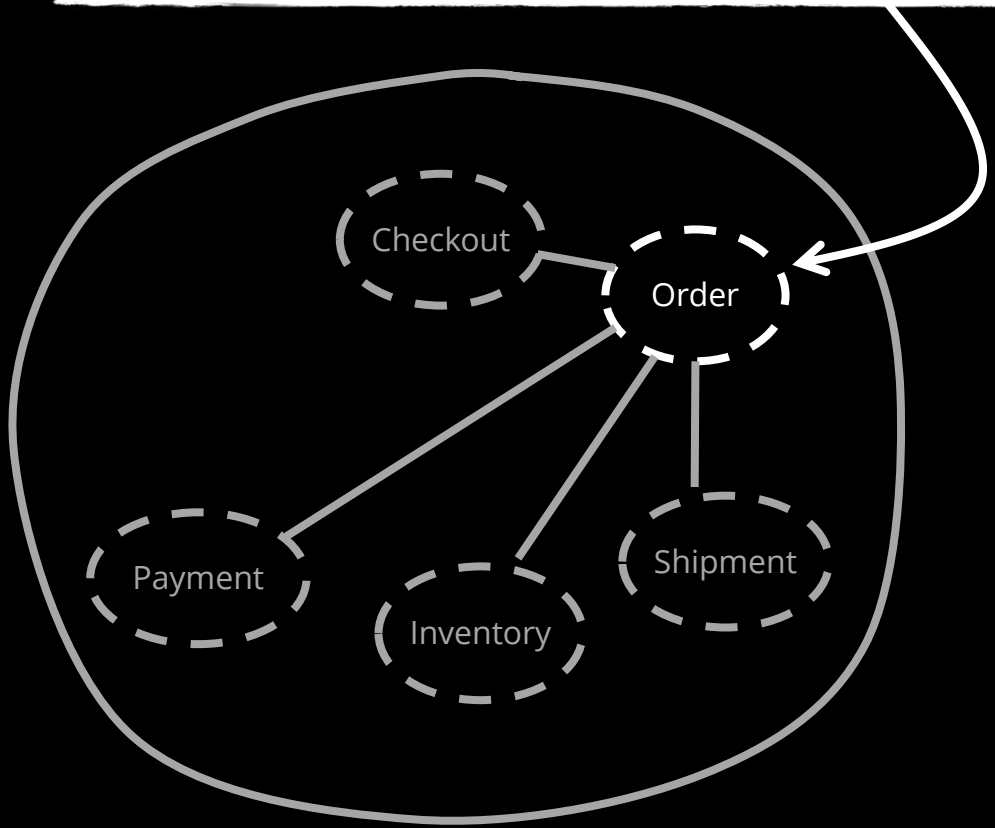


Order decides

. to listen to the event

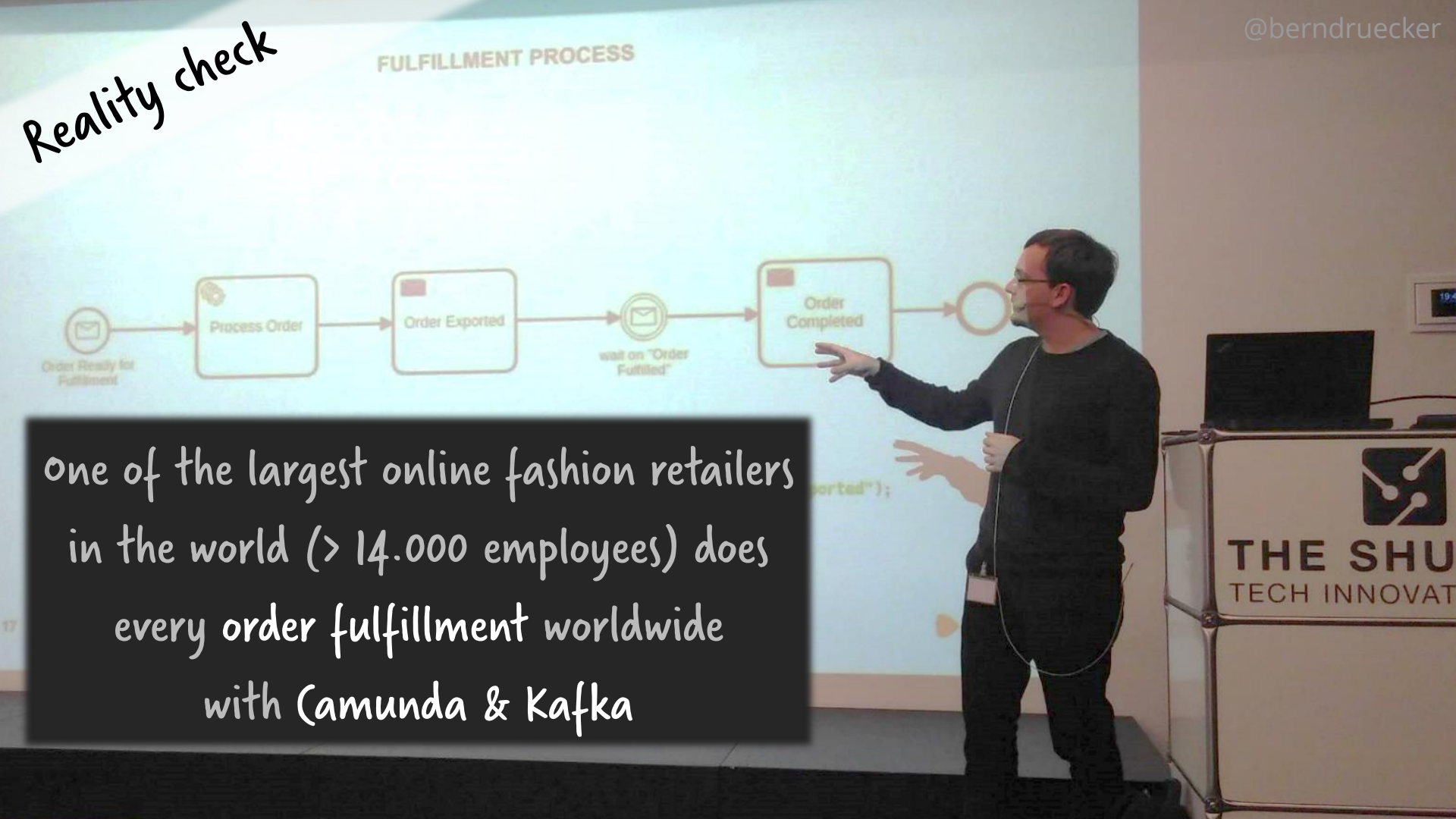
. to issue the command


Order placed
Retrieve payment
Payment received
Fetch goods
Goods fetched
Ship goods
Goods shipped
Order delivered


Checkout
Order
Payment
Inventory
Shipment

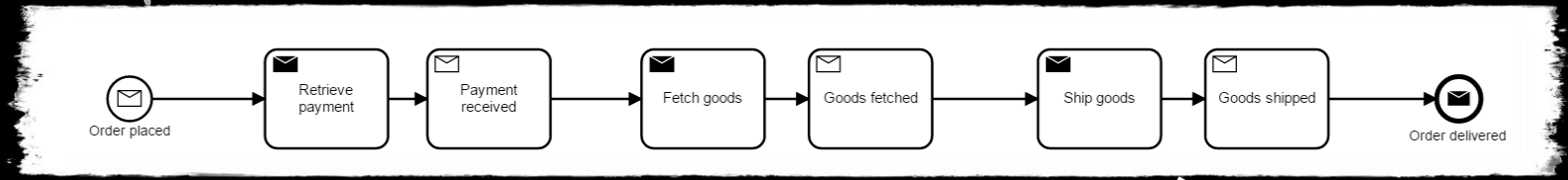
Demo

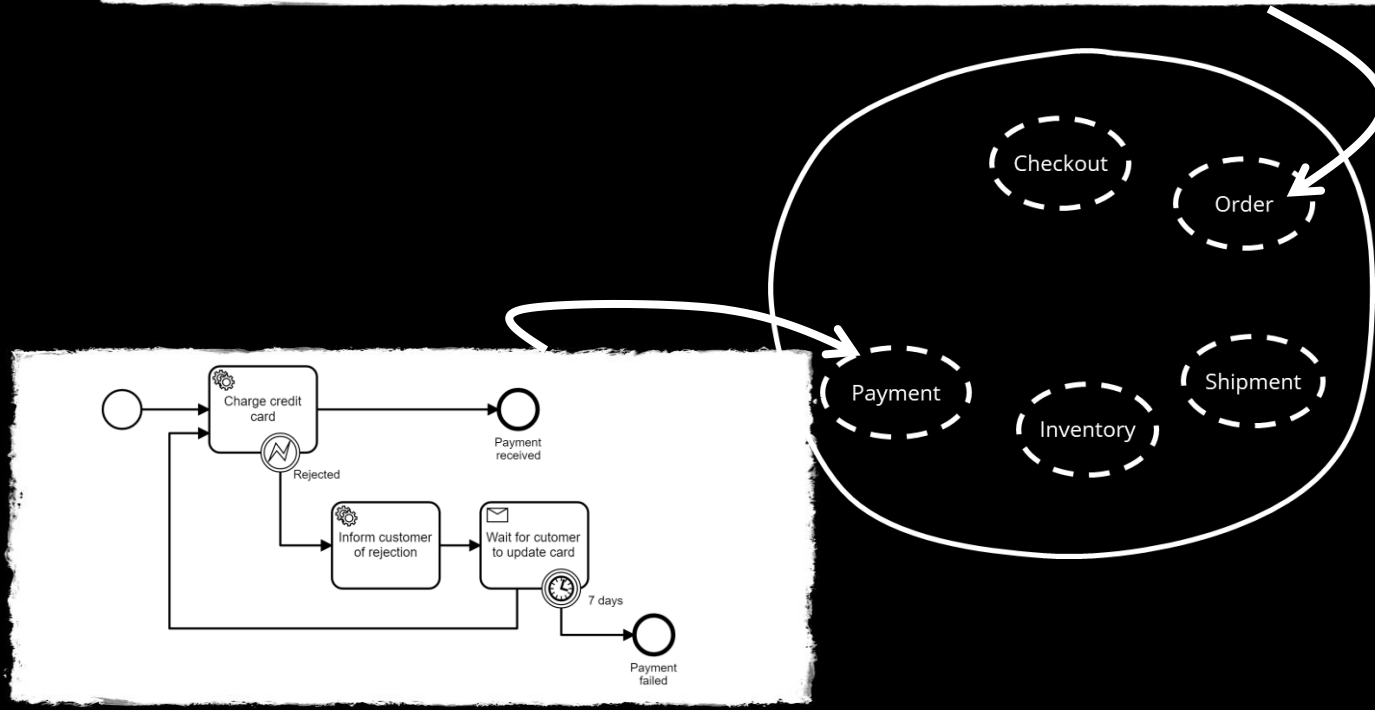
Reality check



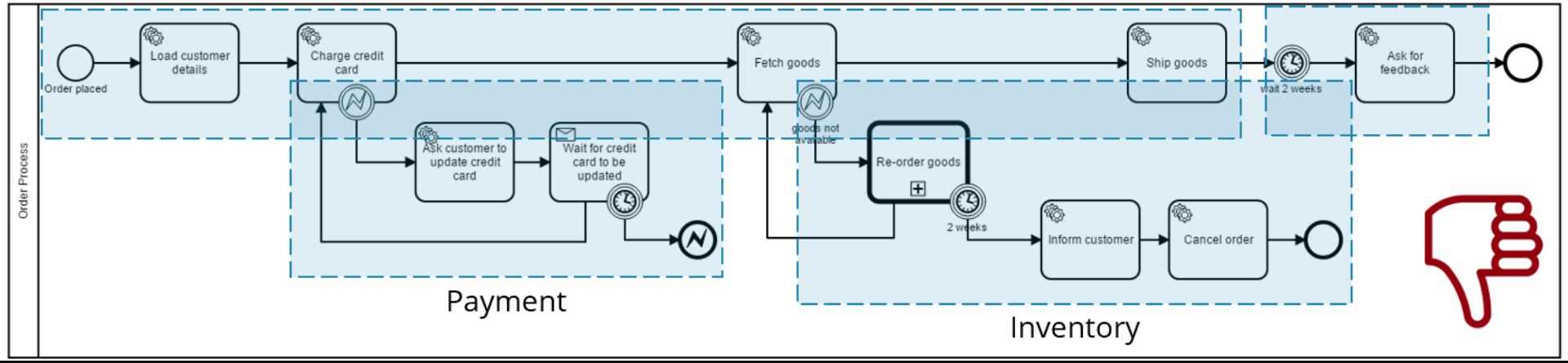
one of the largest online fashion retailers in the world (> 14.000 employees) does every **order fulfillment** worldwide with **Camunda & Kafka**

Workflows live inside service boundaries

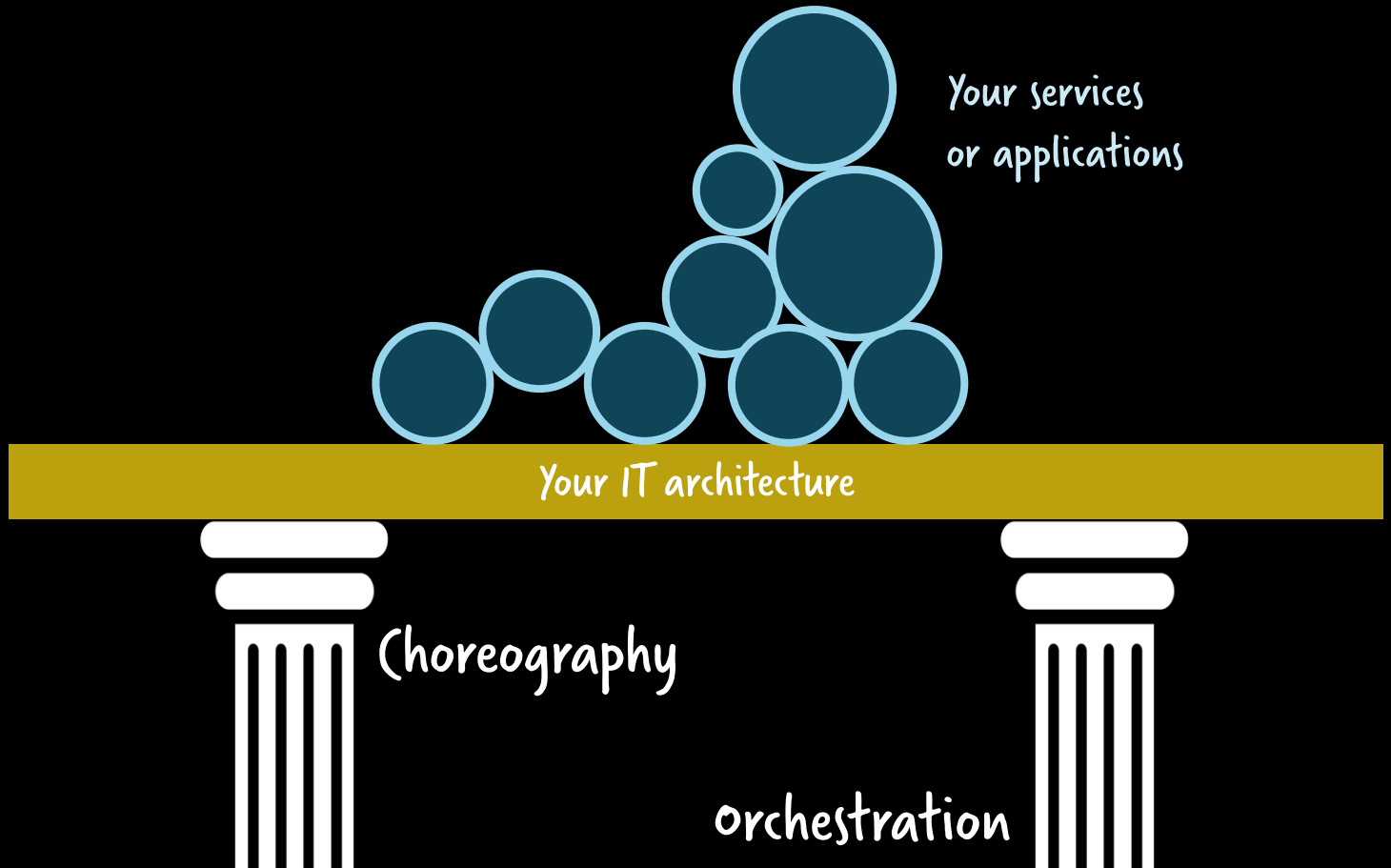




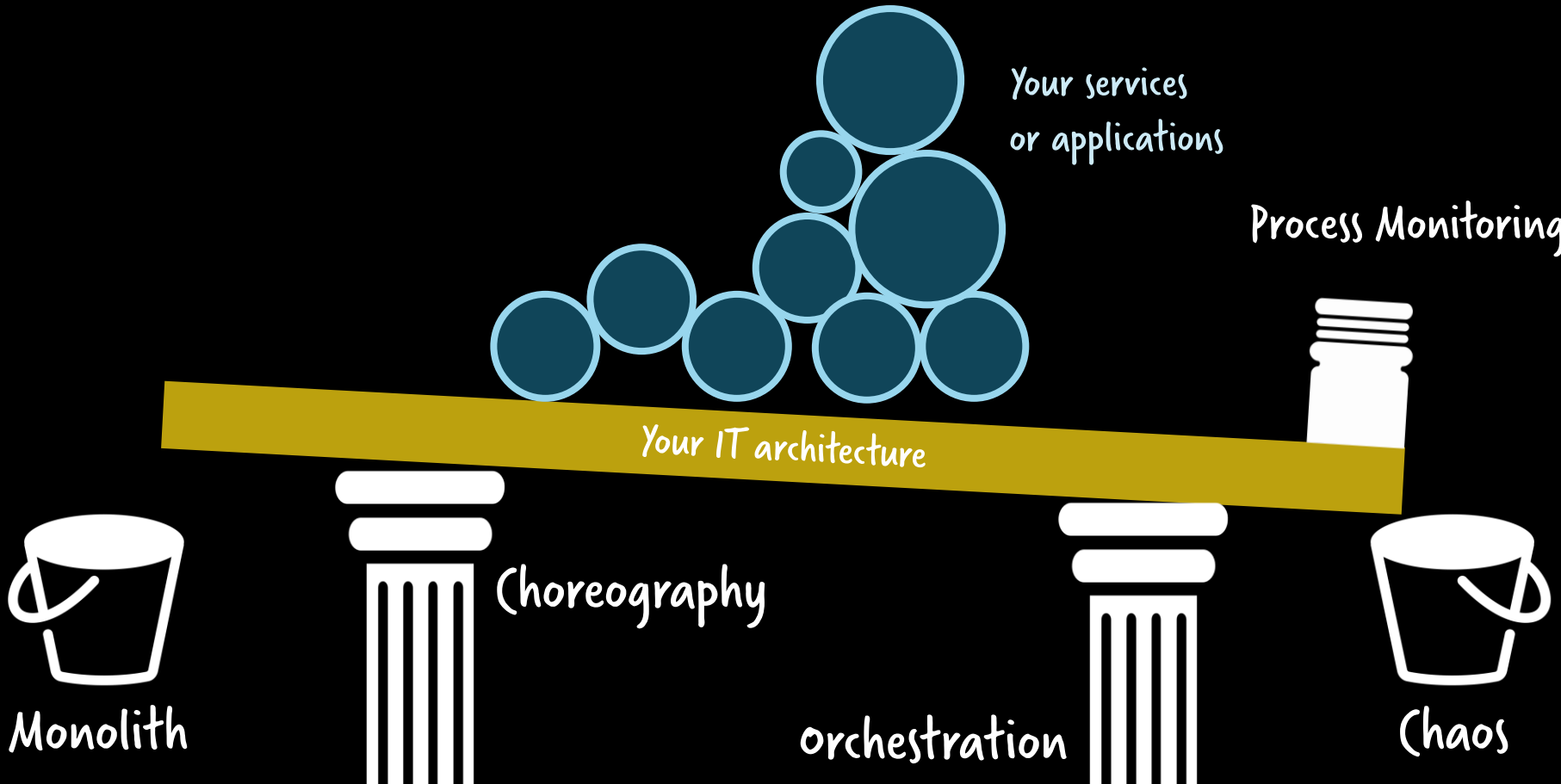
No BPM(N) monoliths



https://blog.bernd-ruecker.com/avoiding-the-bpm-monolith-when-using-bounded-contexts-d86be6308d8


Your services
or applications
Your IT architecture
Choreography
orchestration

@berndruecker



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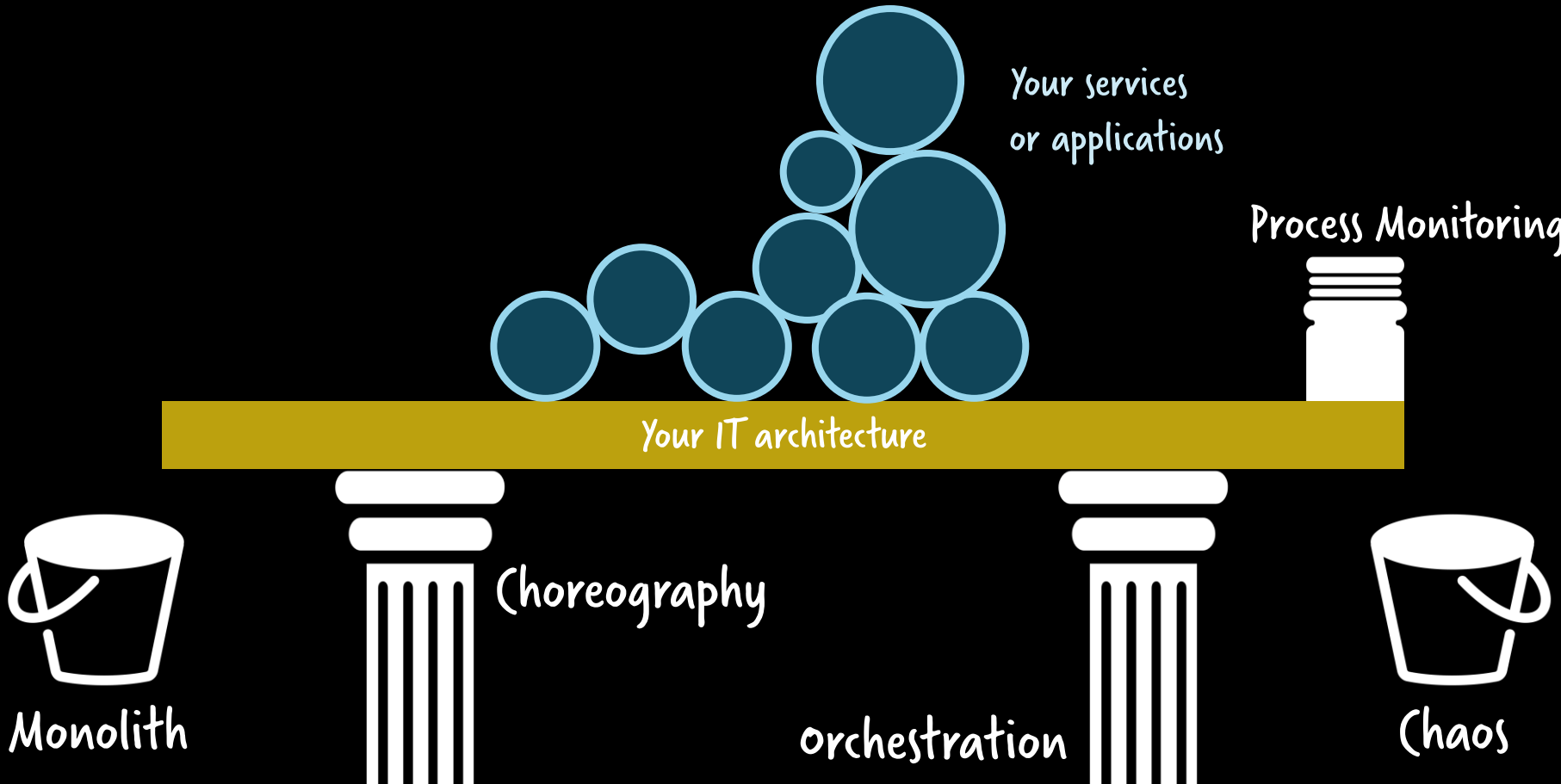
Balance choreography and orchestration



Summary

- Business agility is essential to survive, this is the case for microservices
- Collaboration of services is the new challenge
- Balance orchestration and choreography
- From choreography to orchestration can be a journey
- Workflow automation is a essential building block

Thank you!