Der perfekte Microservice

Size does(n’t) matter!

Lars **Röwekamp**
CIO New Technologies

#**wissen**teilen

@**mobile**Larson
@_**open**Knowledge

Microservices

Monolithic Design

Microservice Design

Surviving Service Design


„Monolithic **Design**”

Was ist das **Problem**?

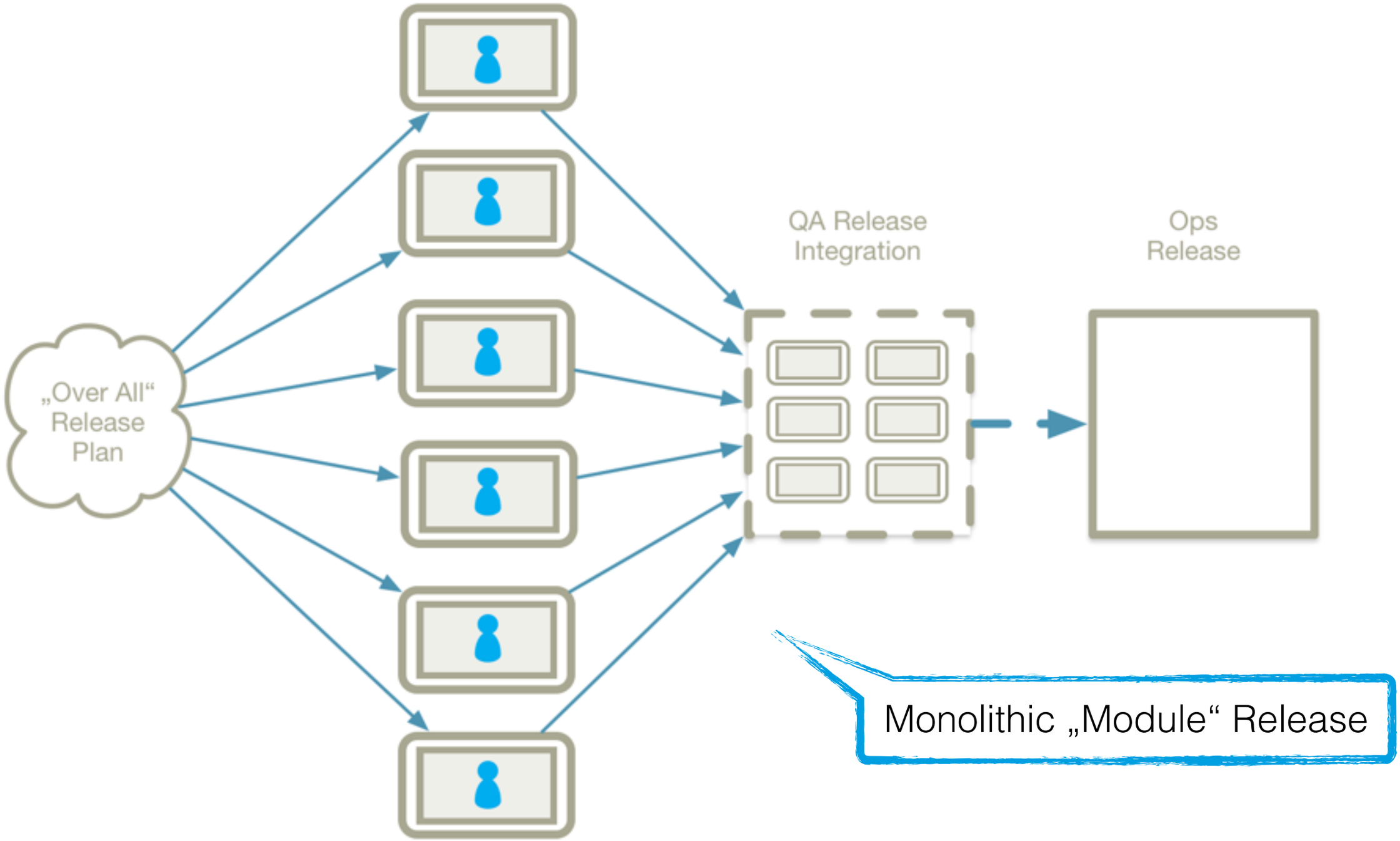
- Umsetzung von Features dauert zu lange
- Architektur-Qualität nimmt ab (an Bedeutung)
- Technologische „Schulden“ sind bekannt
- „-ility“ Probleme wohin man schaut
- Replacement/Refactoring ist zu teuer

- Deployment ist kompliziert und dauert lang
- Skalierung hat Limit erreicht

Was ist das **Problem**?

„For a monolithic to change
all must agree on each
change.
Each change has
unanticipated effects
requiring testing beforehand.“

Was ist das **Problem**?



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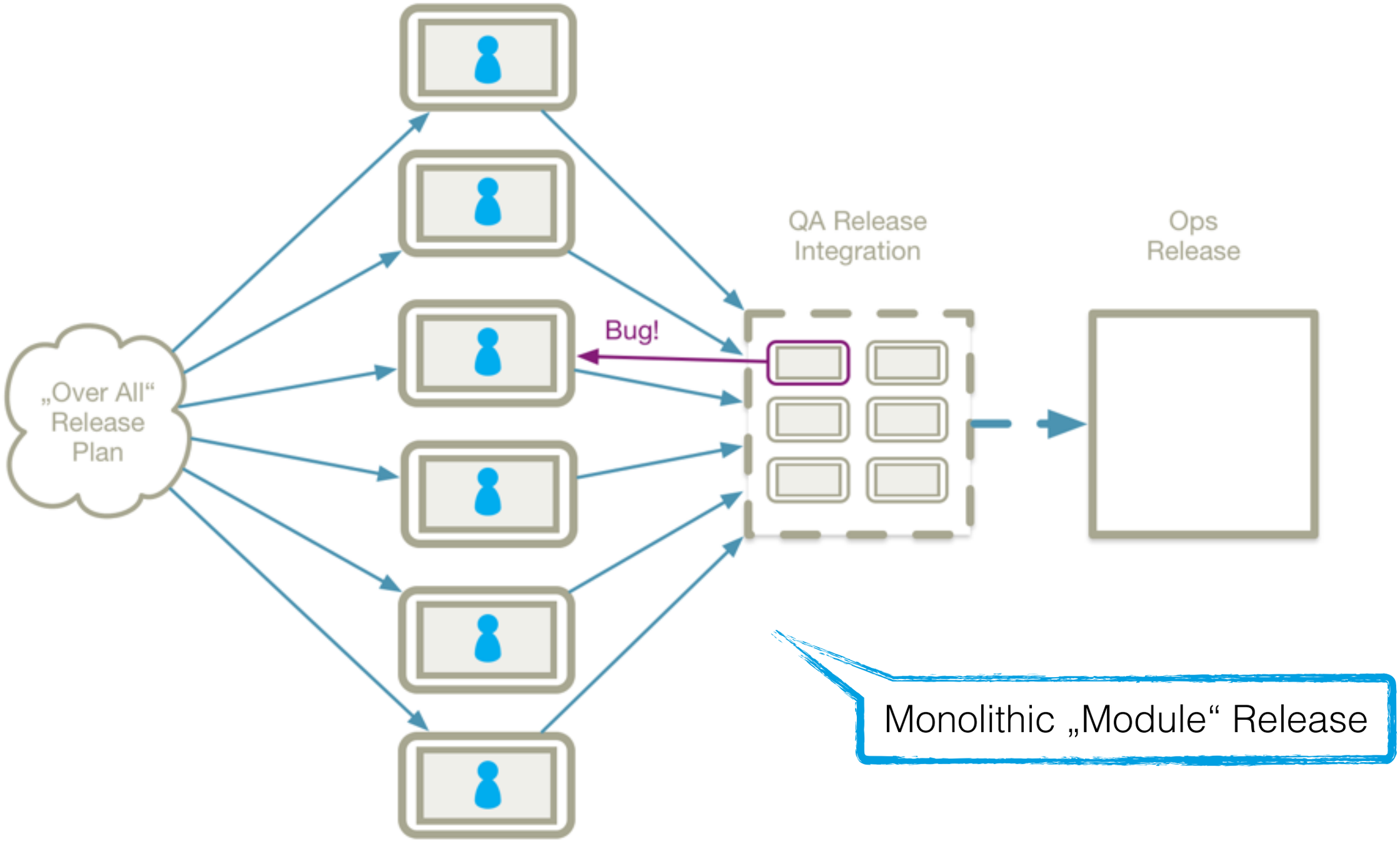

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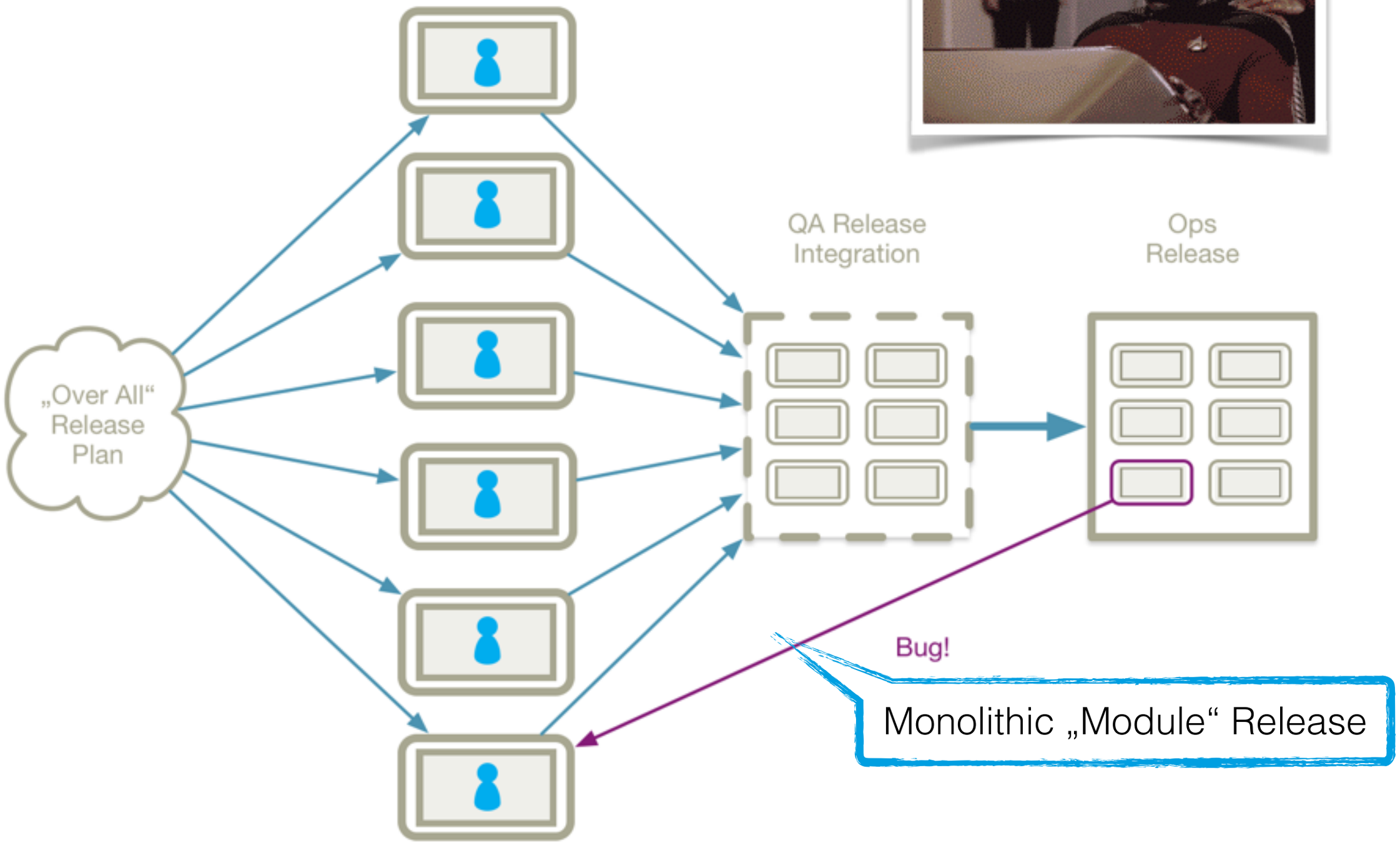

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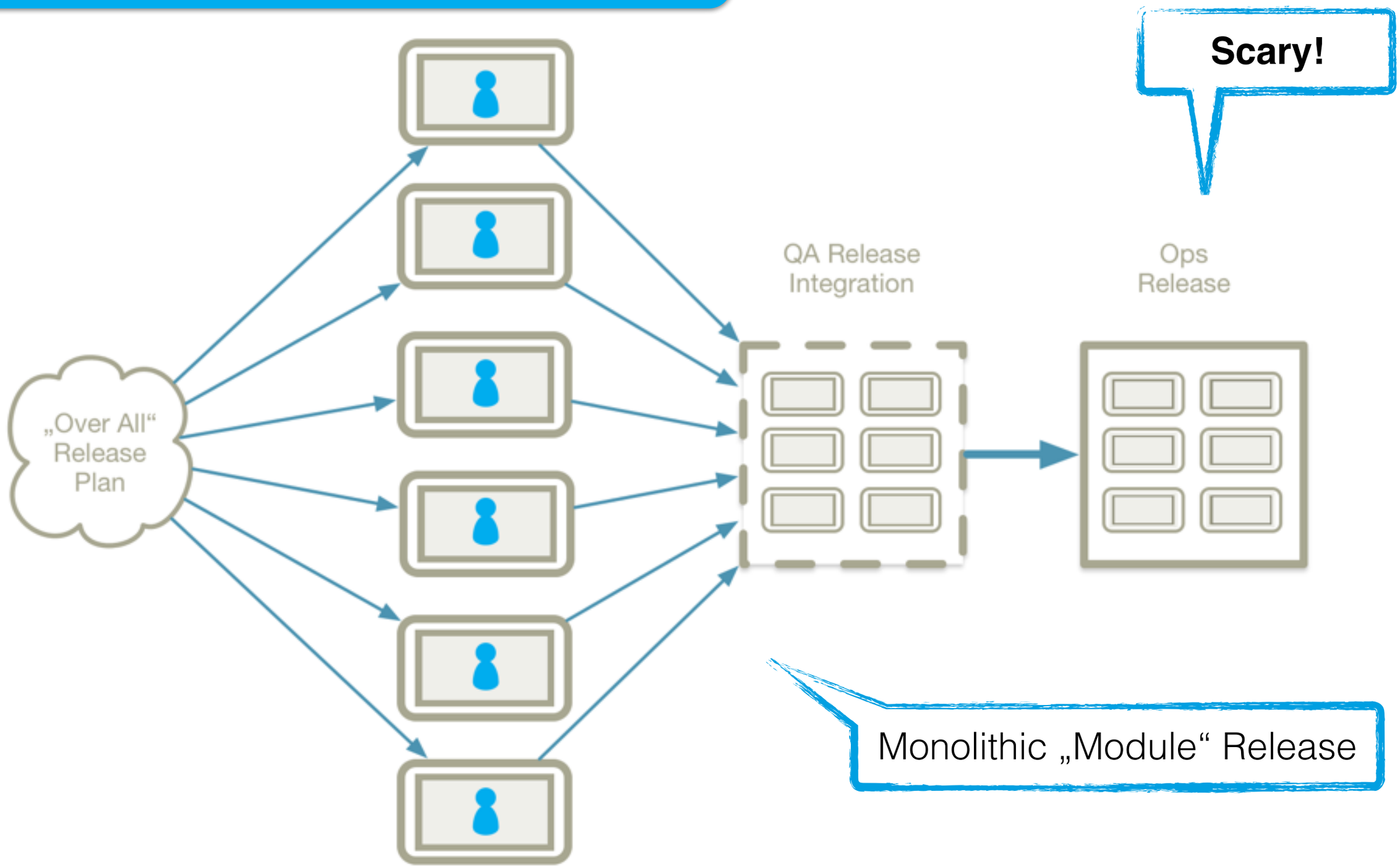
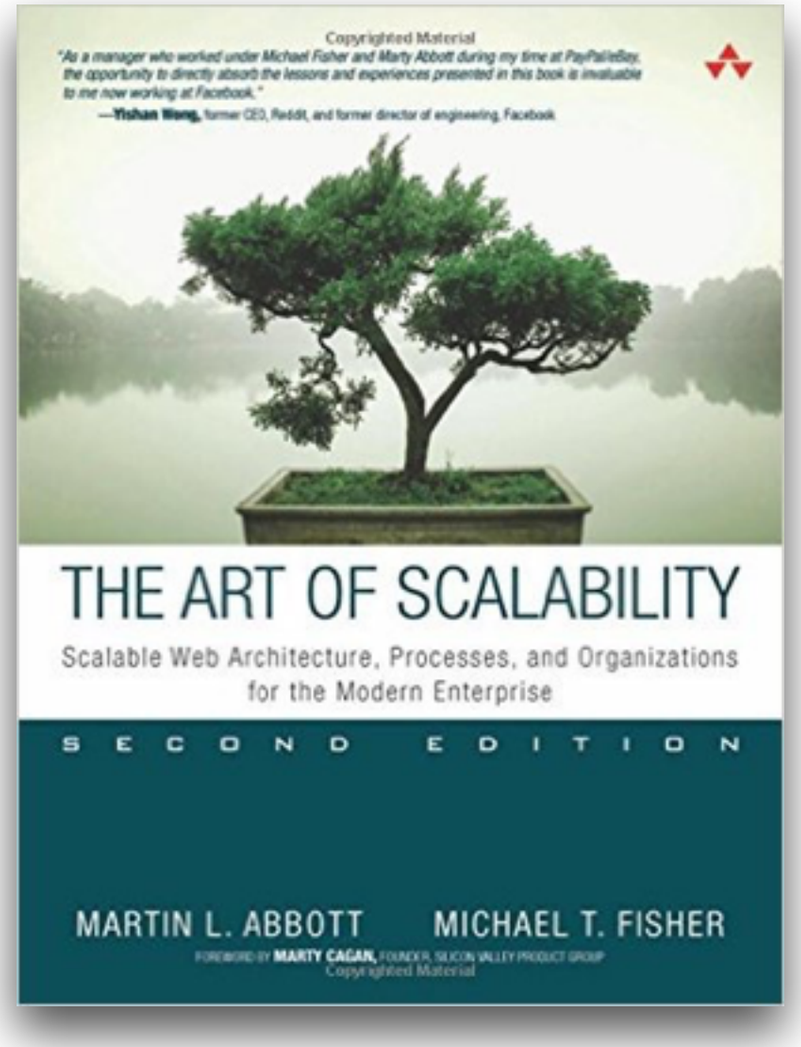
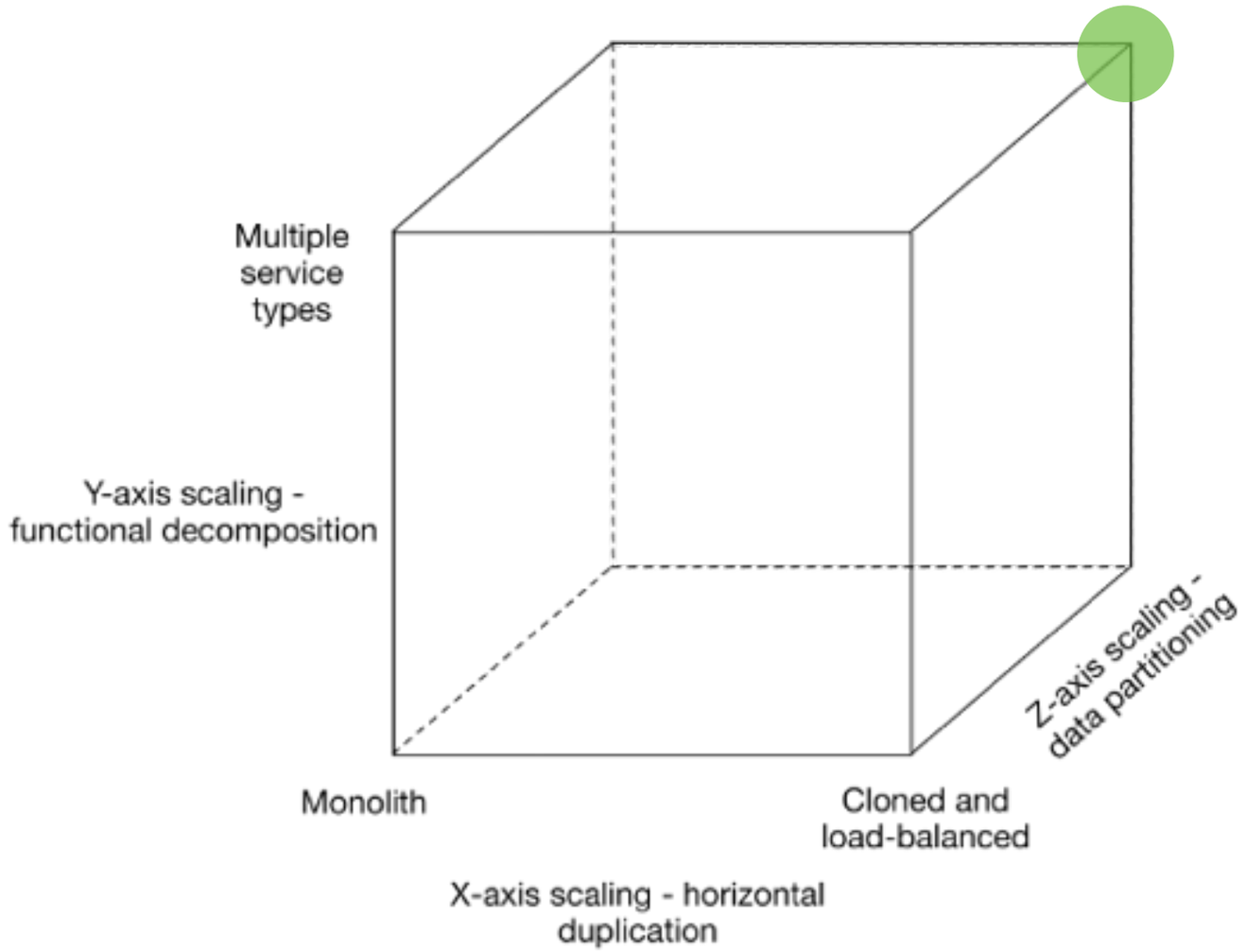


Was ist das **Problem**?

„You want to be **here**.“





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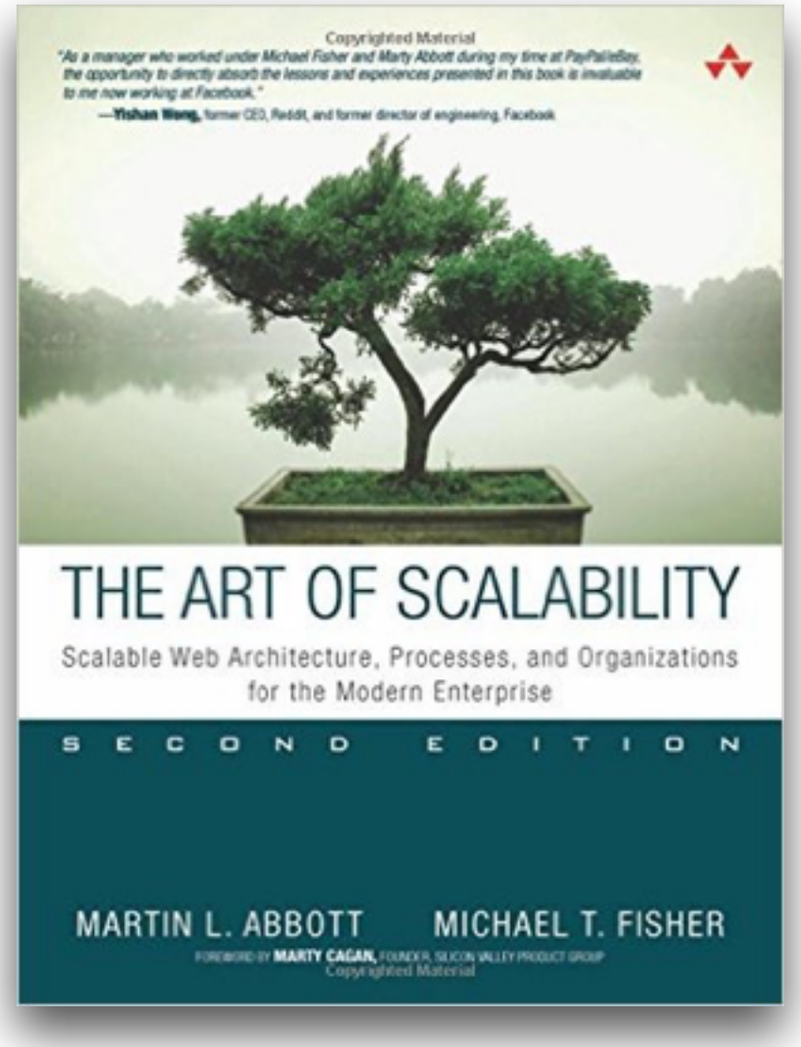

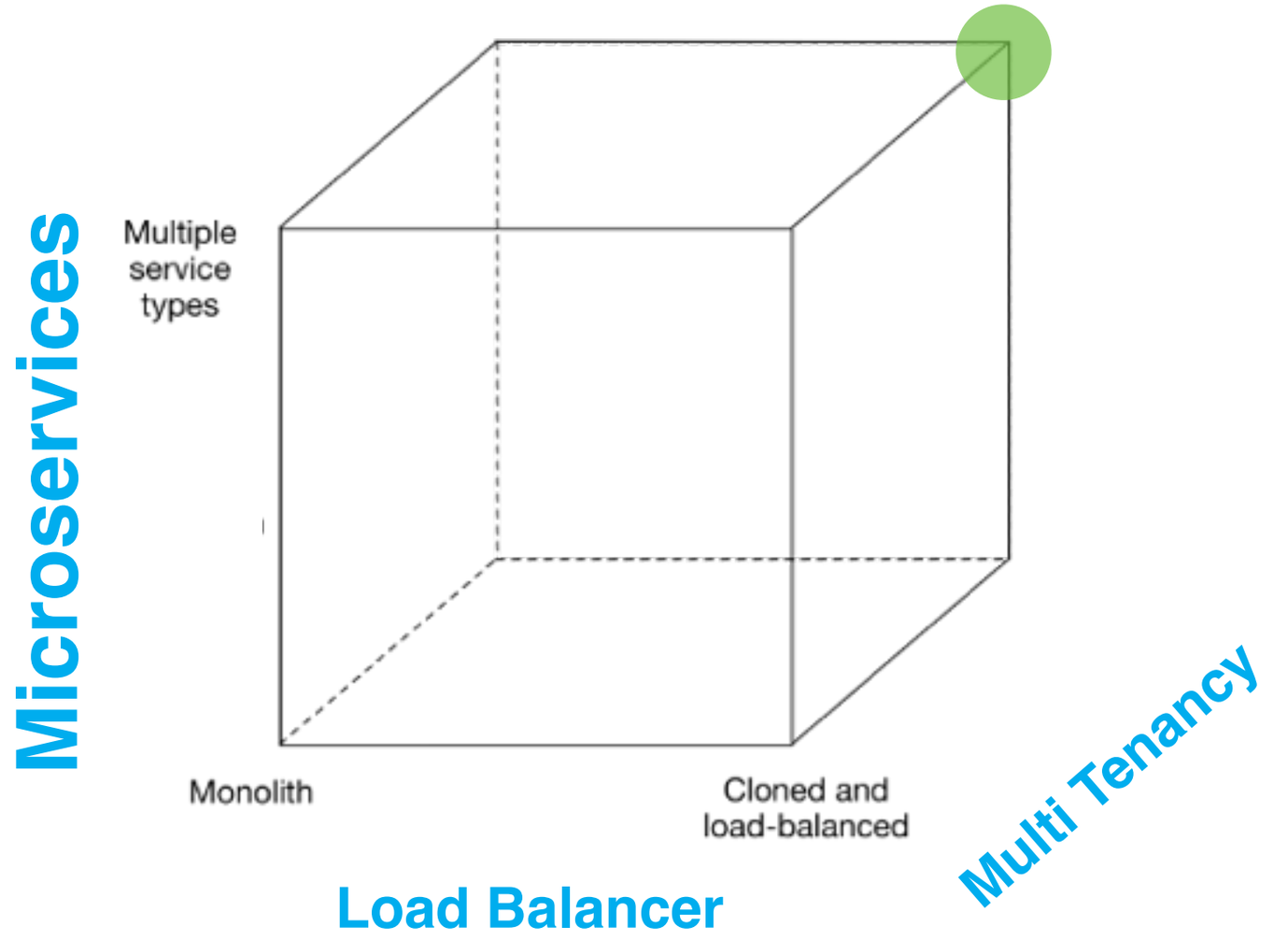

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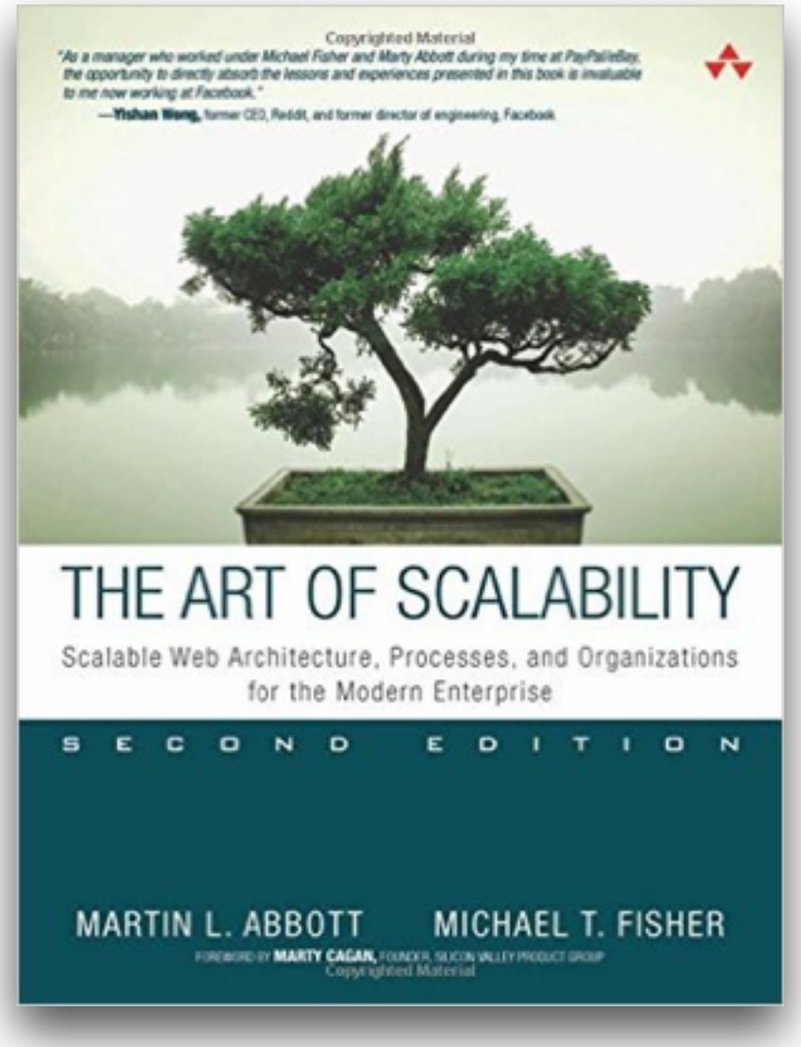
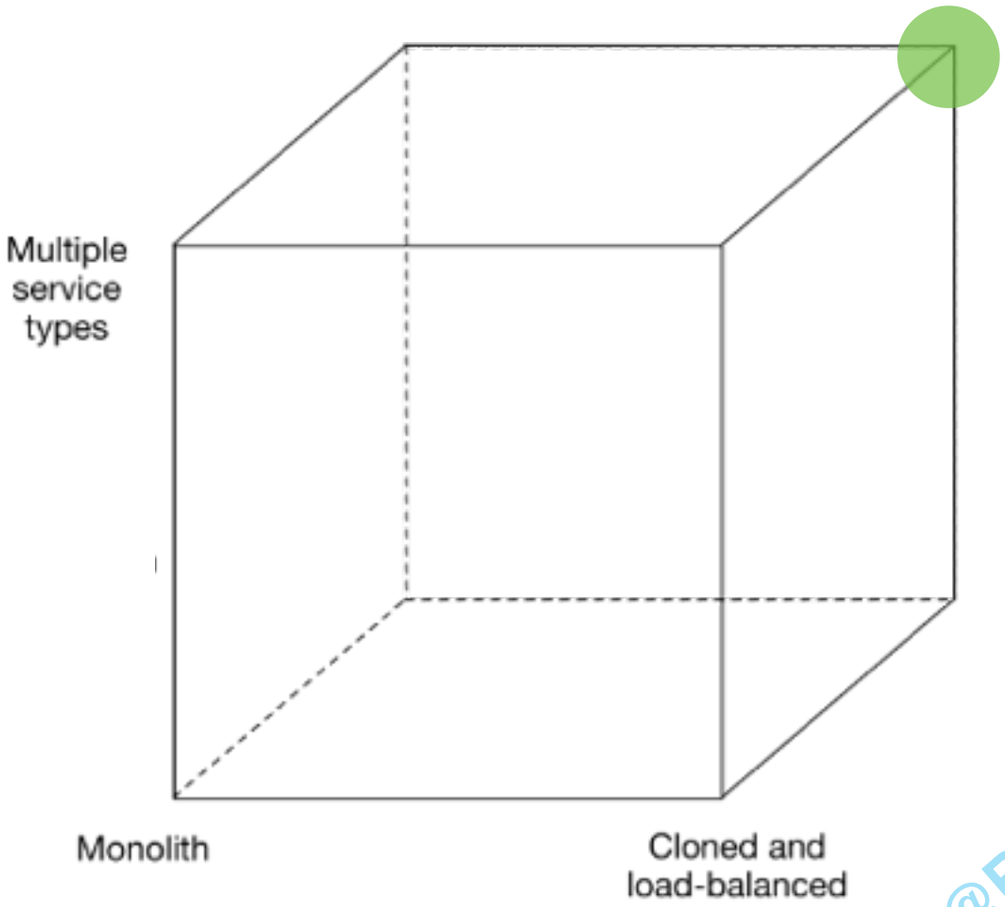


a.k.a. „Time to Market“



@Runtime

@Runtime

„**Help**; needed it is.”

Microservices

Monolithic Design

Microservice Design

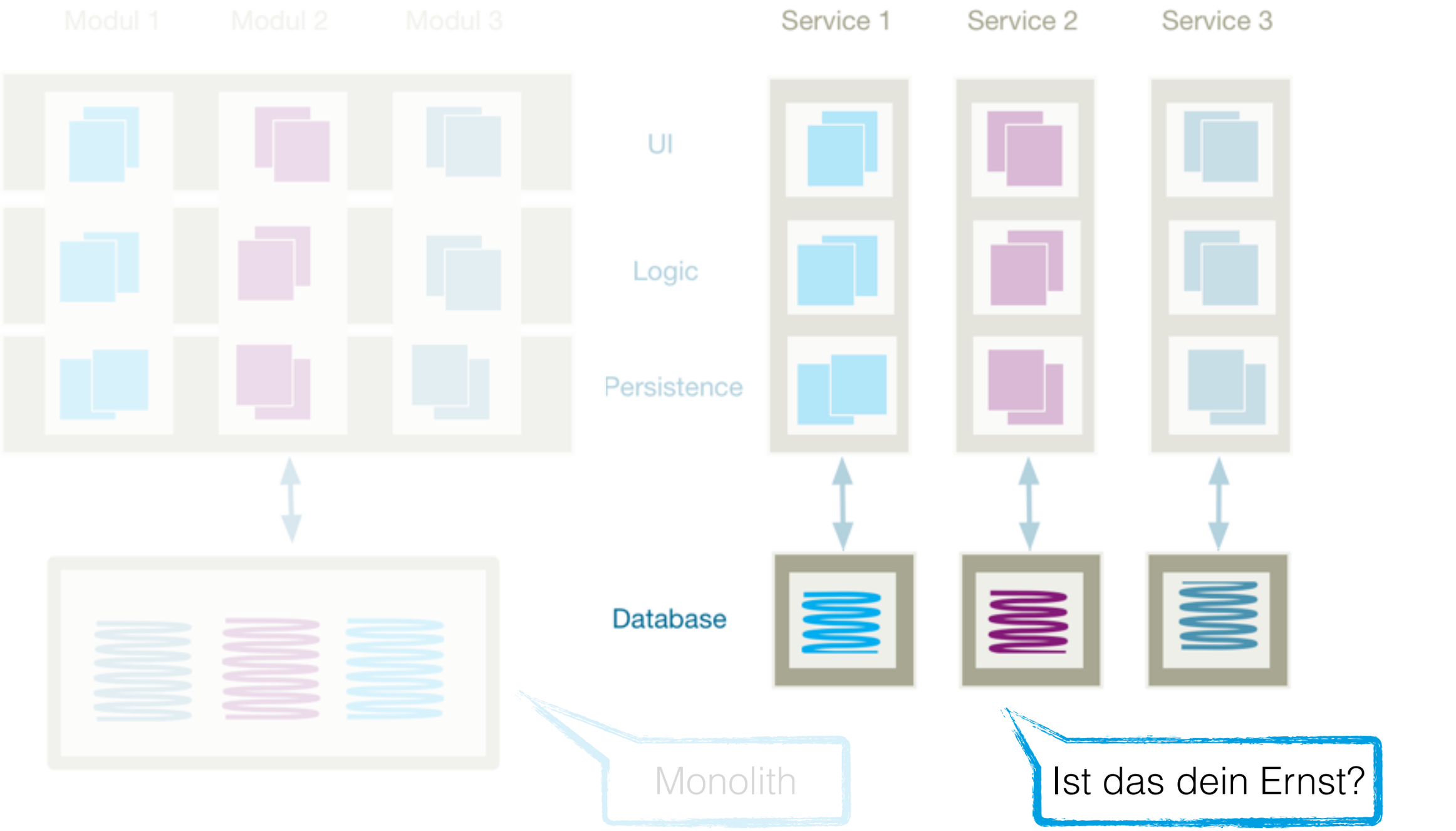
Surviving Microservice Design

„Kind of Definition“

„In short, the microservice architectural style is **an approach to developing a single application as a suite of small services**, each running in its own process and communicating with lightweight mechanisms, often an HTTP resource API.”

„As well as the fact that services are **independently deployable and scalable**, each service also provides a **firm module boundary**, even allowing for different services to be written in **different programming languages**. They can also be **managed by different teams**.”

Microservice Design



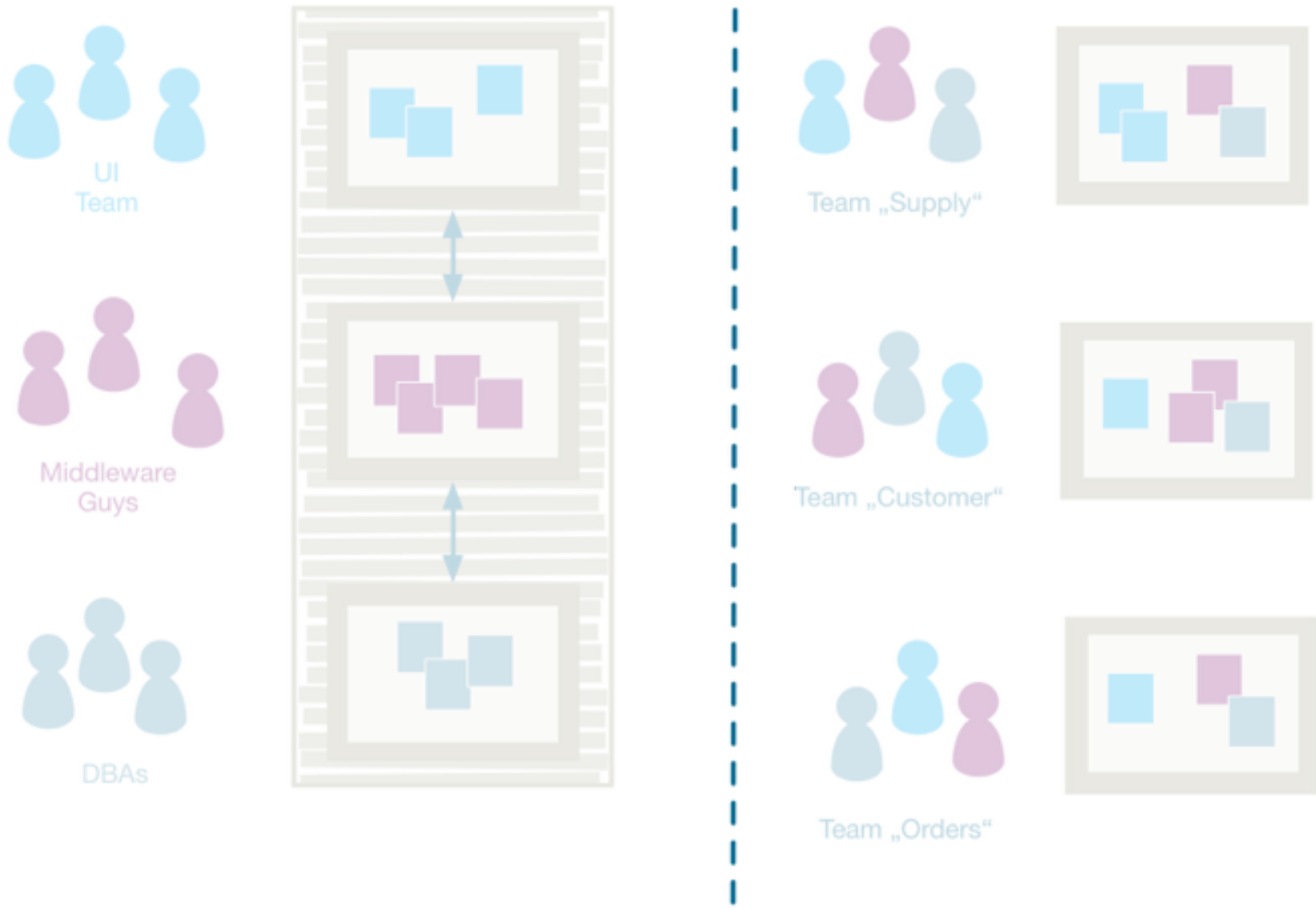
Microservice Design

„Any **organization that designs a system** (defined broadly) will produce a design whose structure is a **copy of the organization's communication structure**.“

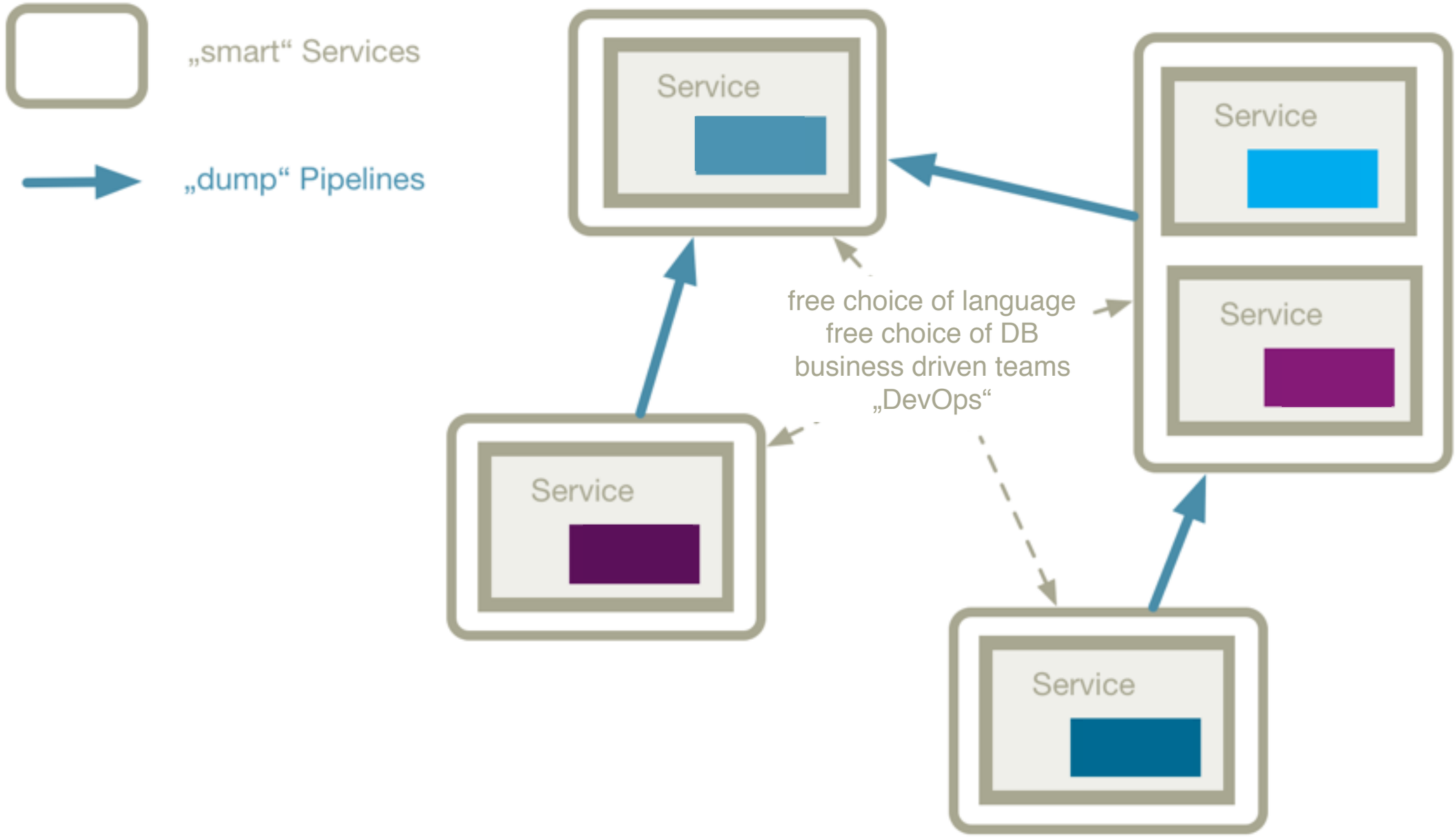
Conway’s Law (1967)

Microservice Design

Conway's Law



Microservice Design



Microservice Design

- Wartbarkeit
- Erweiterbarkeit
- Austauschbarkeit
- Skalierbarkeit
- Zuverlässigkeit & Ausfallsicherheit
- Fehlertoleranz
- „Time to Market“

Klingt gut, oder?

Microservices

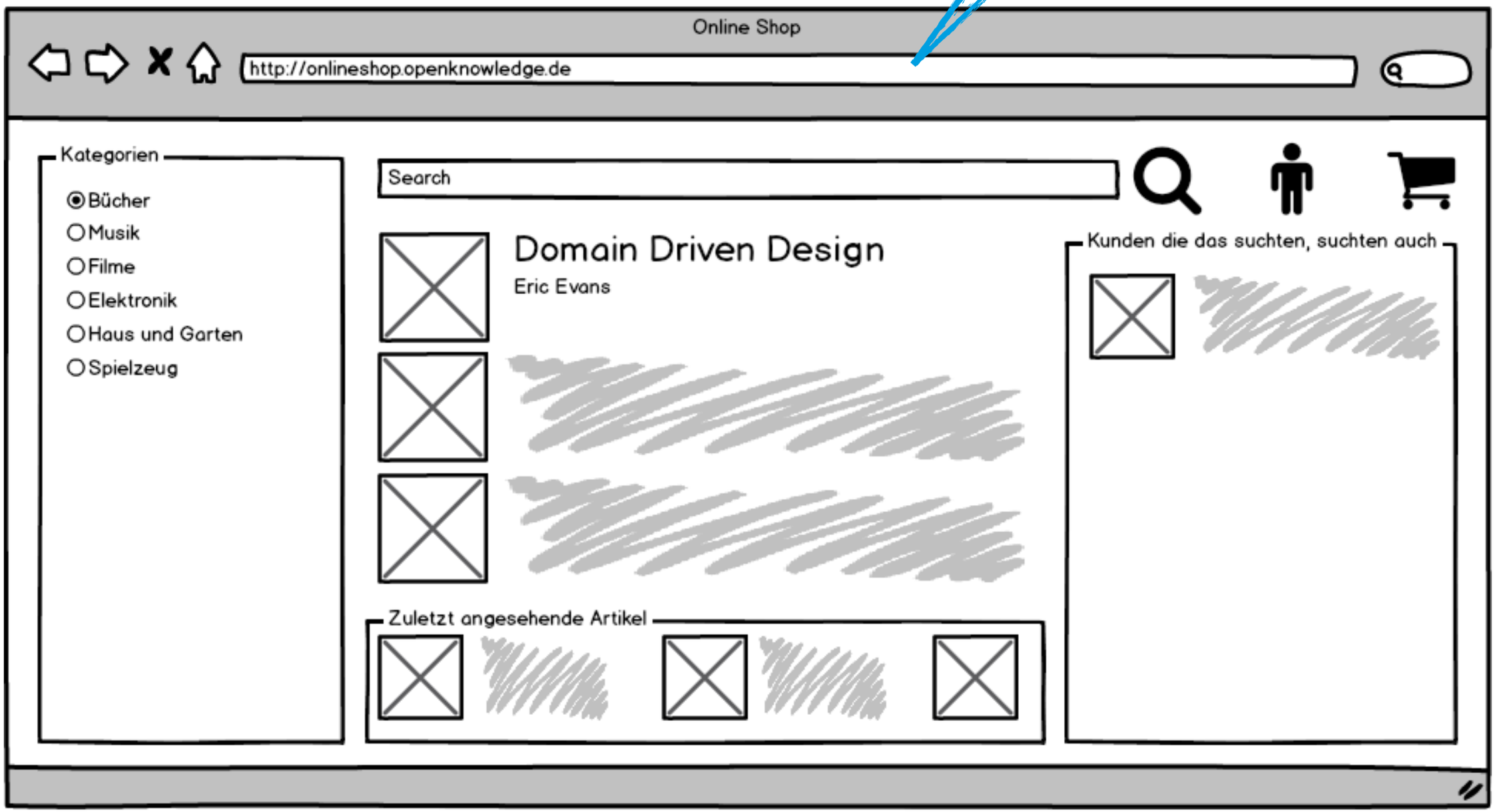
Monolithic Design

Service Design

Surviving Service Design

Surviving Service Design

Microservices?



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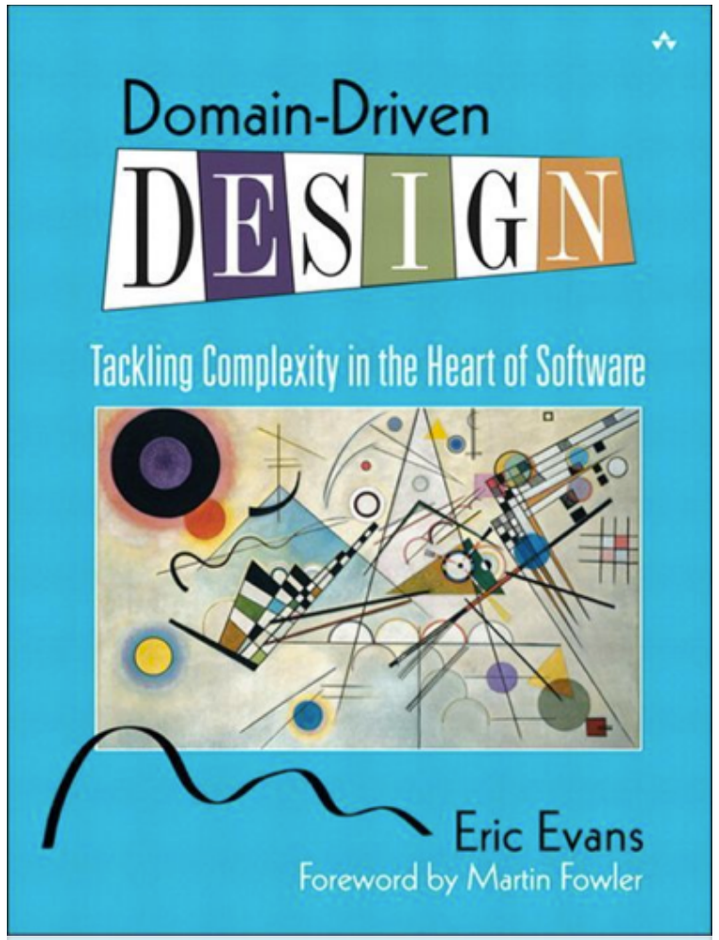

„For most software projects, the primary **focus** should be on the **domain** and **domain logic**.“

Eric Evans, 2004

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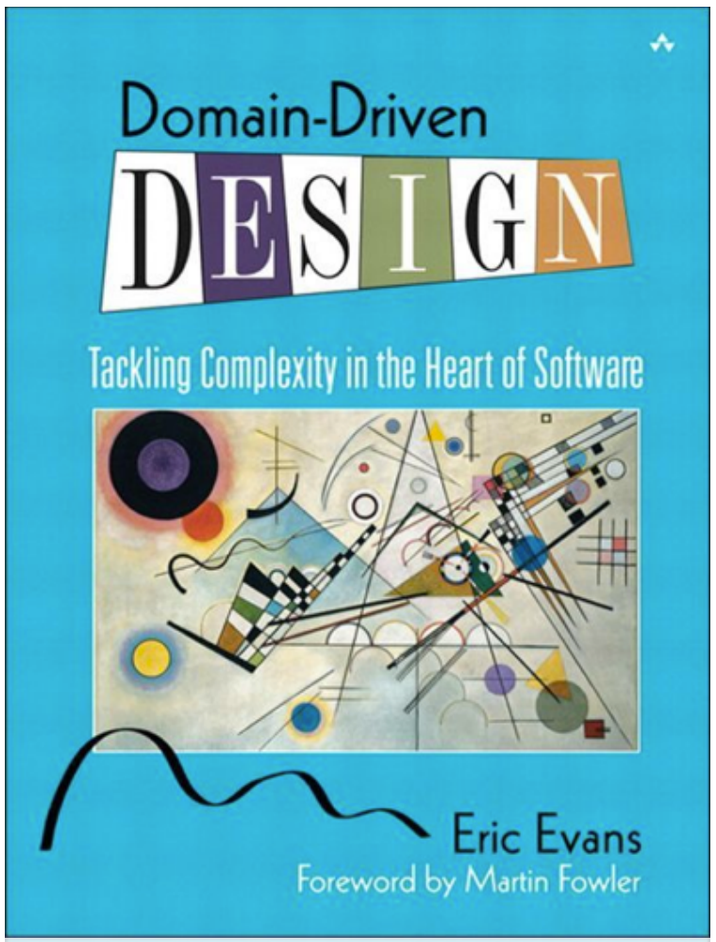
Abstraktion der realen Welt!



„Complex domain design should be based on a **model**.“

Eric Evans, 2004

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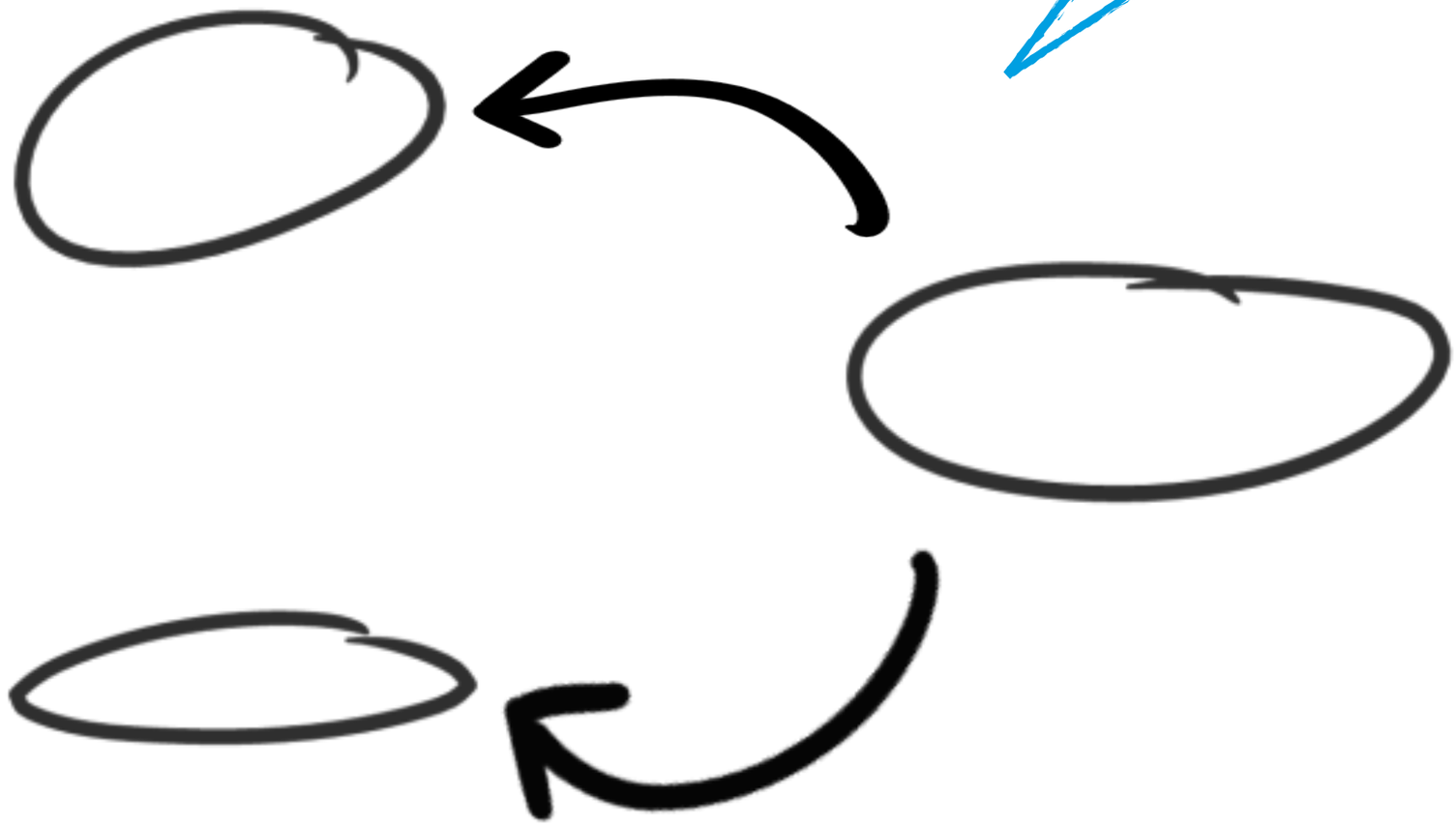
Und was ist **unser** Domänenmodell?



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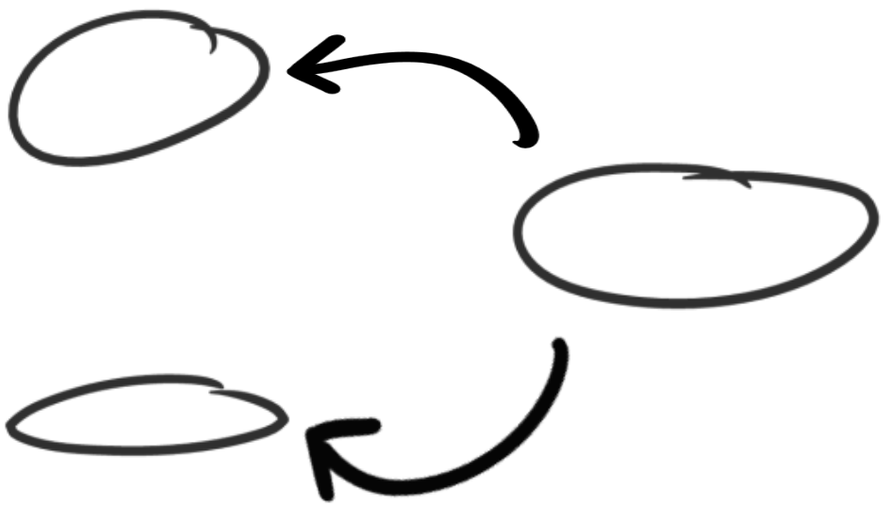

Domänenmodell

- **Ableiten** der Objekt(namen) aus gemeinsamer Sprache
- **Evolution** des Modells durch alle Beteiligten
- Änderungen in der **Sprache** sind Änderungen im **Modell!**

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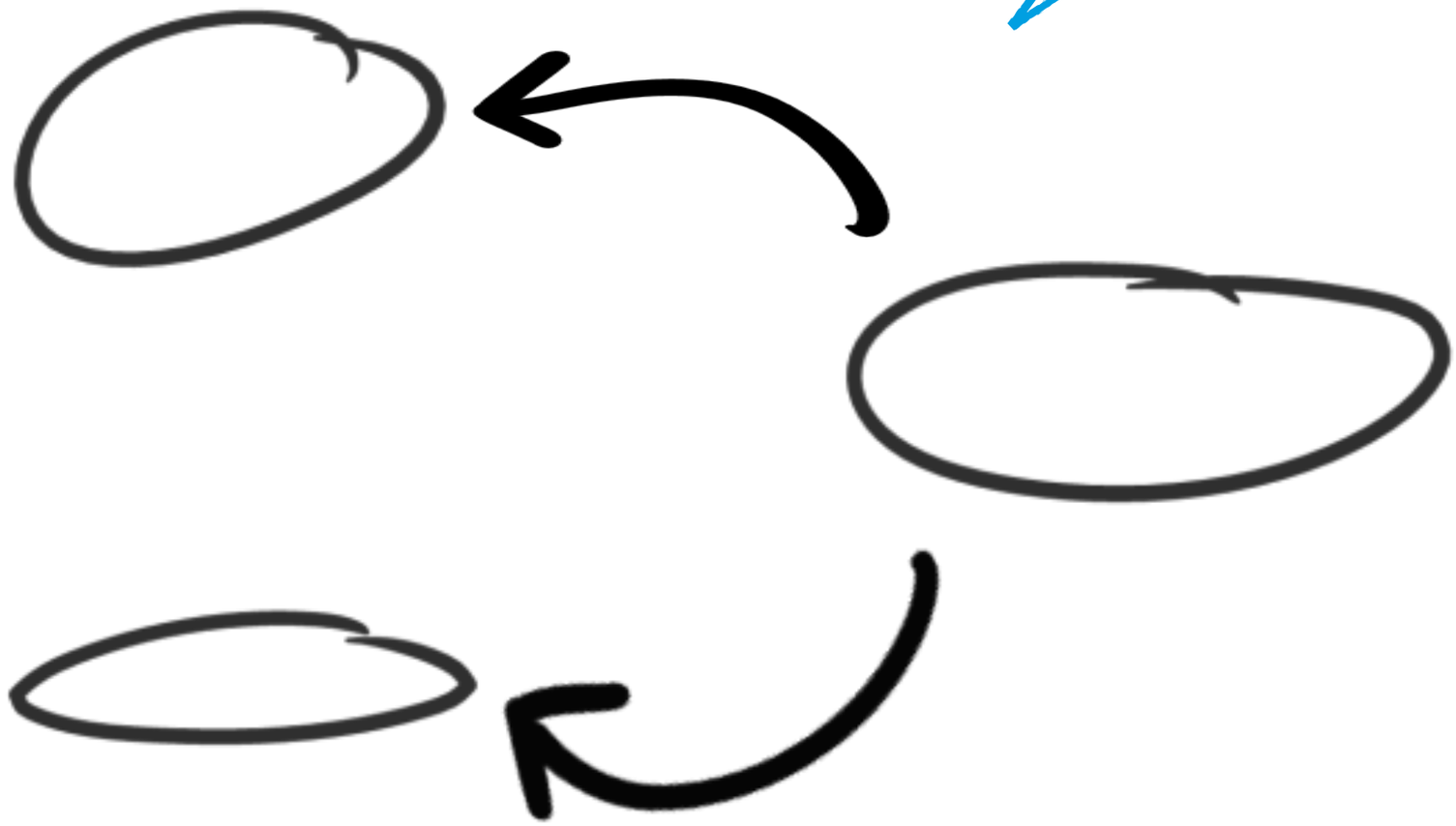
Ein Modell
für alle?



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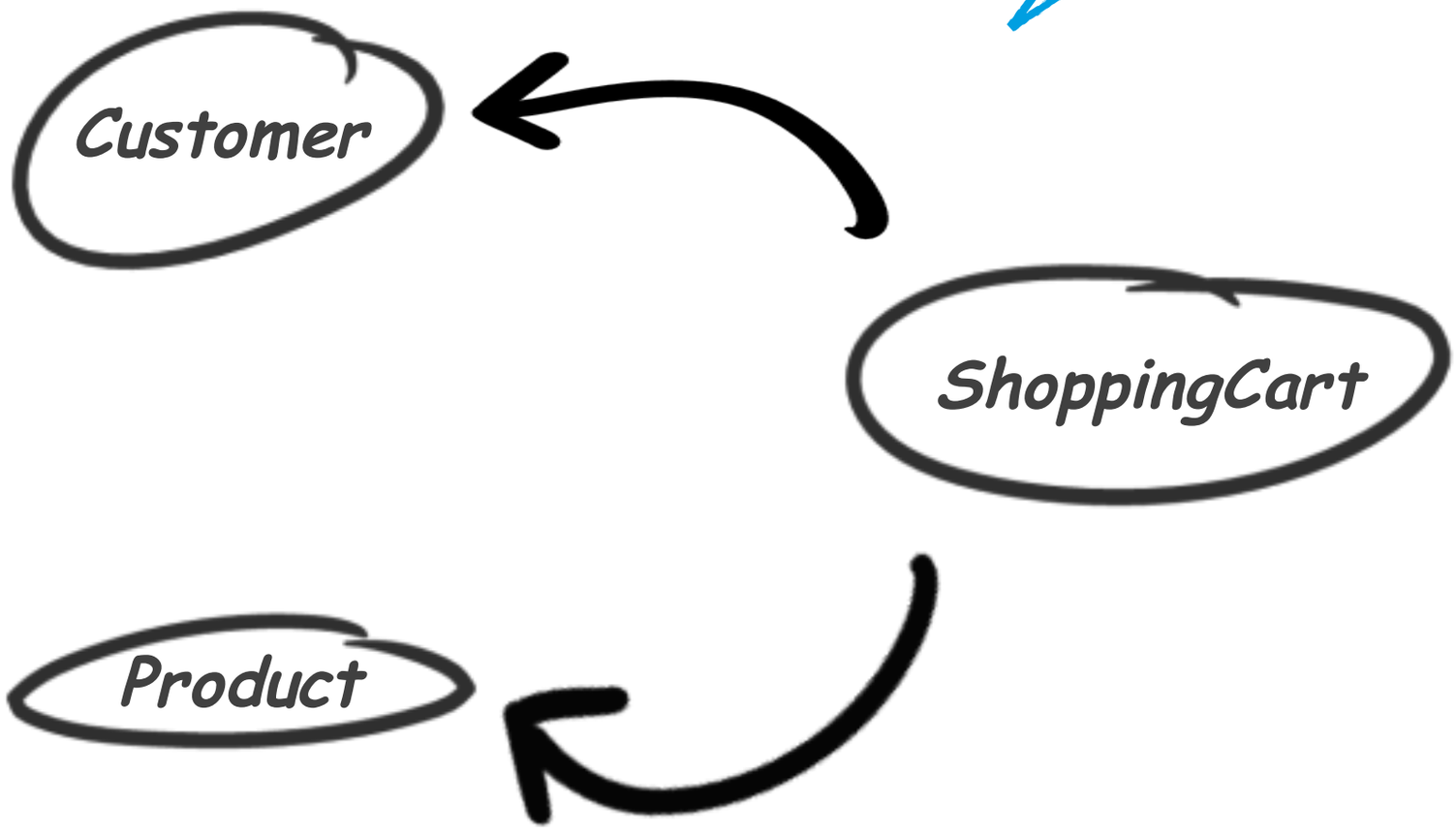
Ganz schön groß, oder?



„Einheit, die von einem kleinen Team - **fachlich** und **technisch** - beherrscht werden kann.”

Oliver Wegner (OTTO)

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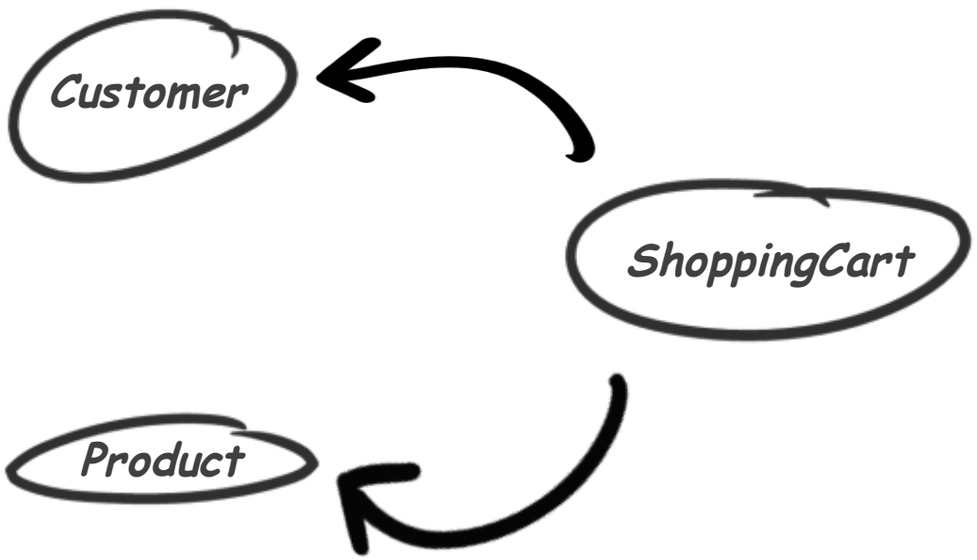

Die **Herausforderung**:

- Auftrennen ohne Verlust der Vorteile von DDD

Mögliche **Konflikte**:

- „verschiedene“ Modelle
- „verschiedenes“ Verständnis

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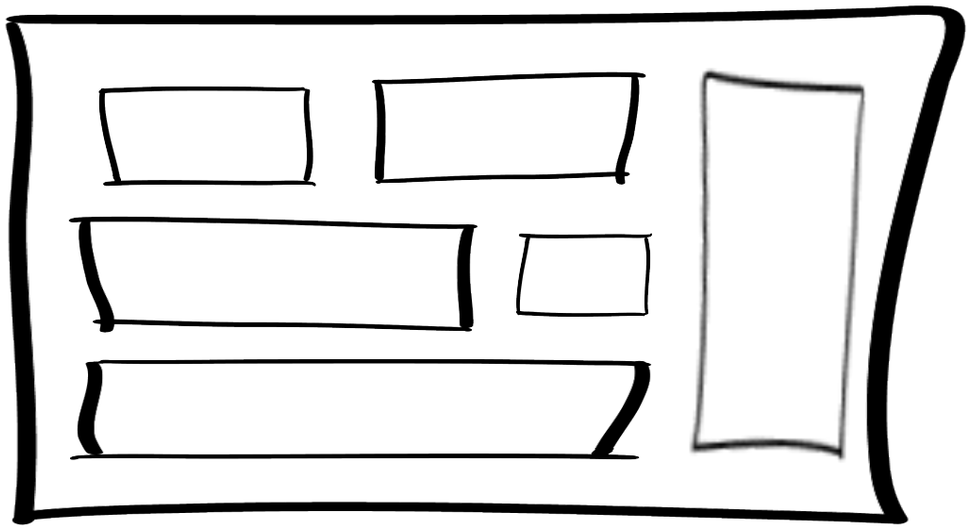

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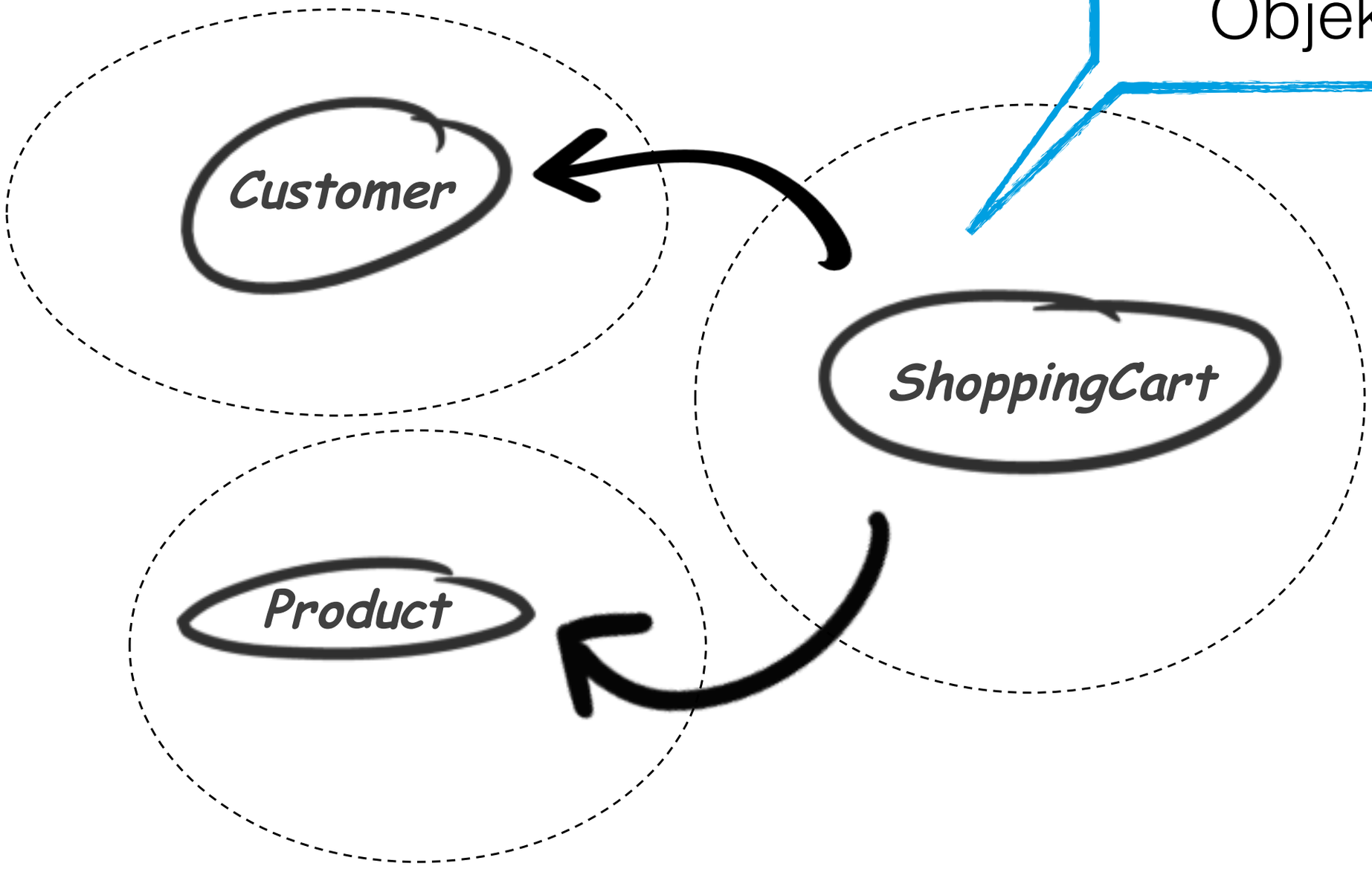
Split Strategie: „Domänen Objekte“




„If every Service has to be updated at the same time, it’s **not loosely coupled**!”
by Adrian Cockcroft (ehemals Netflix)


„If you have to know too much about the surrounding services you don’t have a **bounded context**!”
by Adrian Cockcroft (ehemals Netflix)

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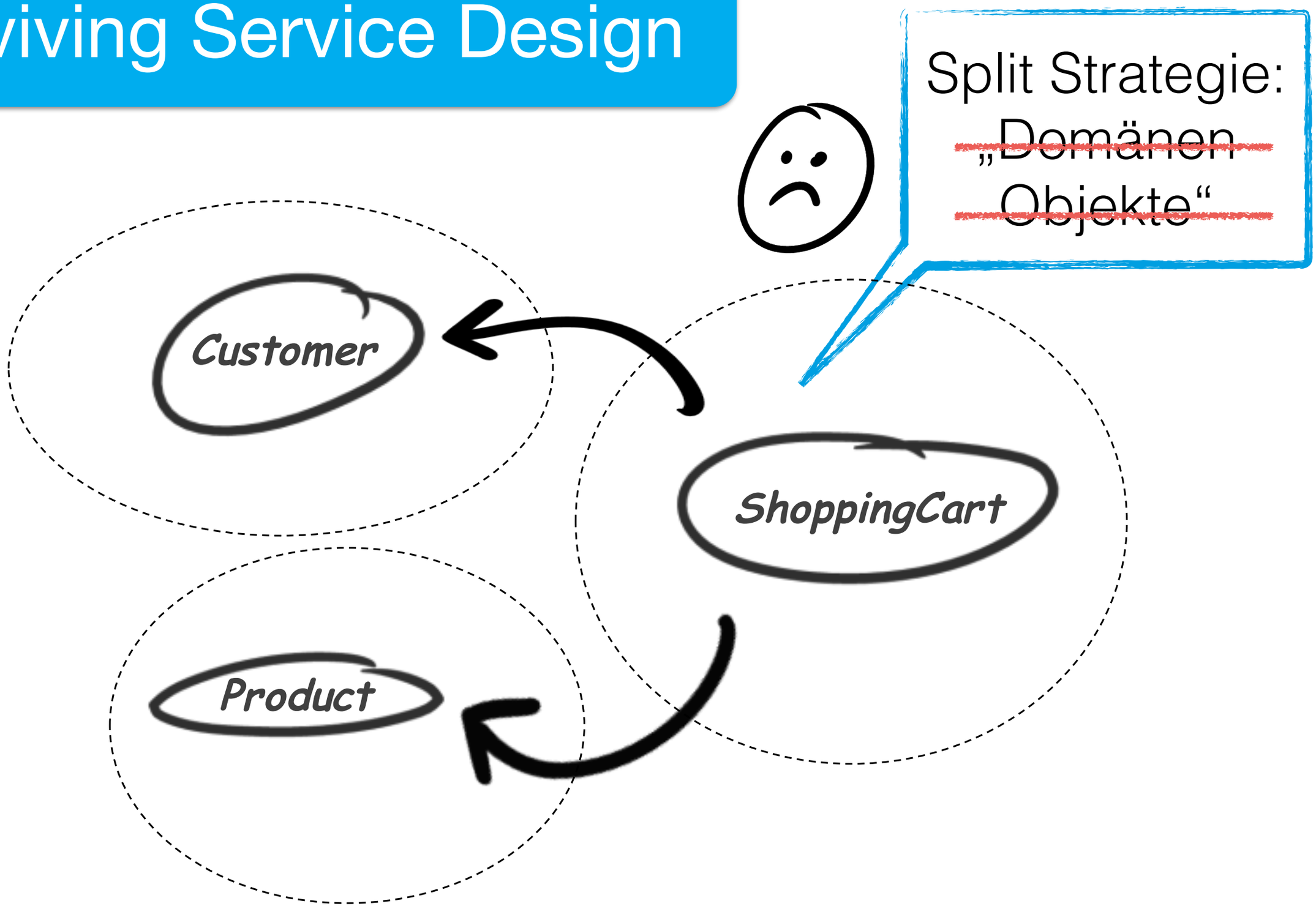

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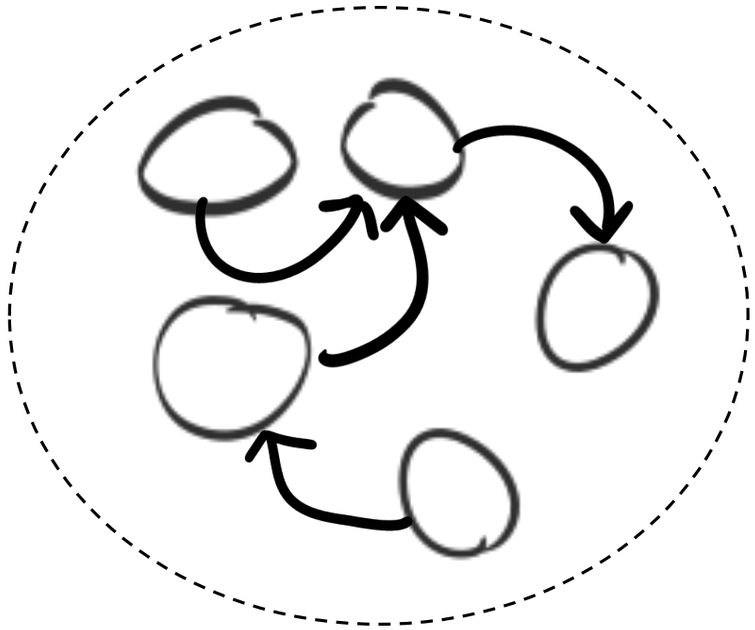
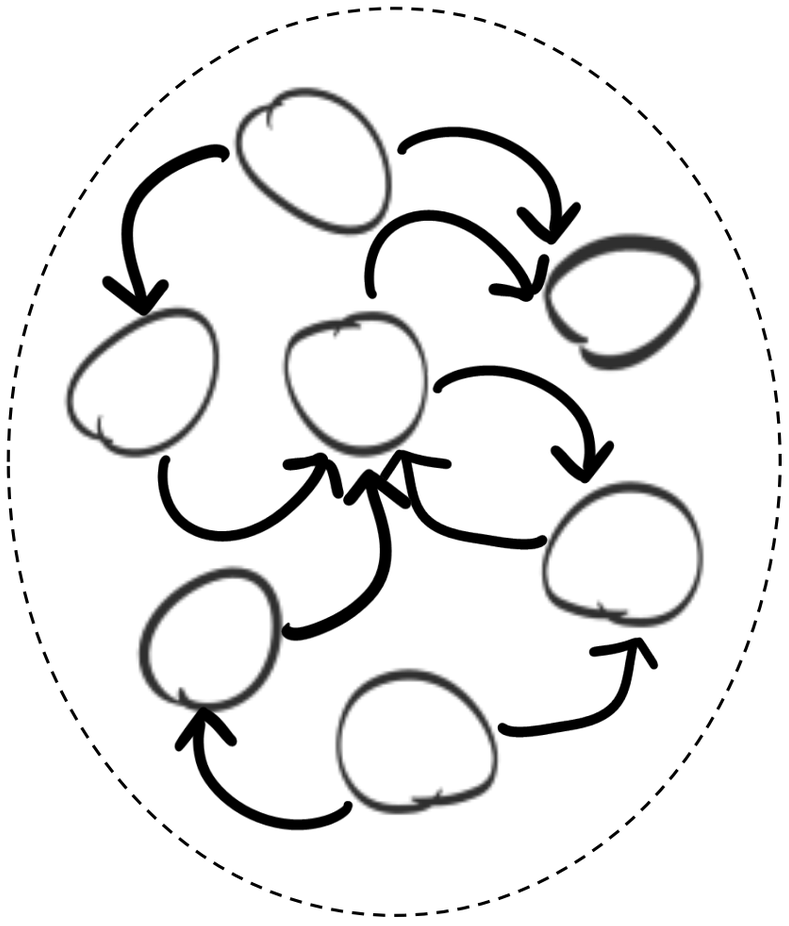
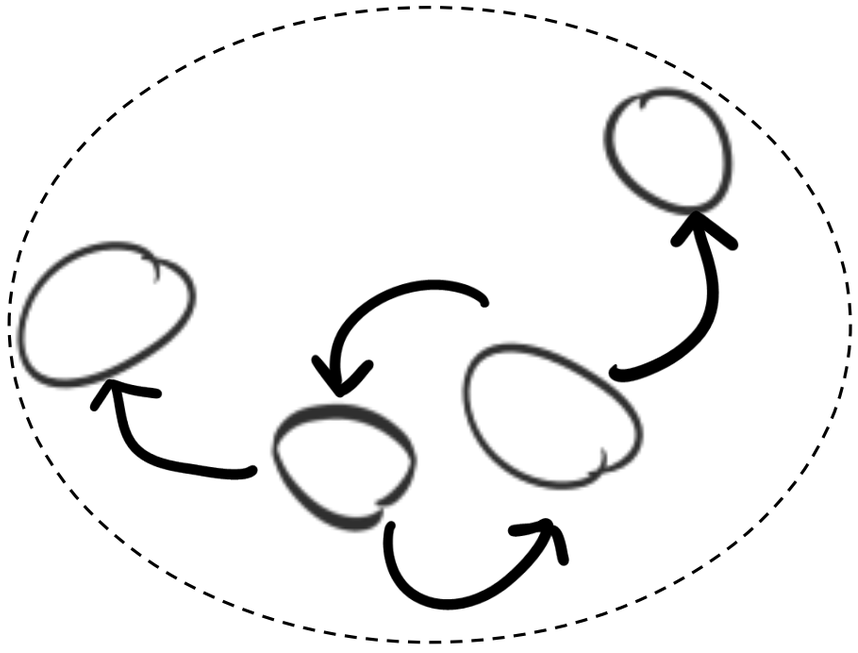
Split Strategie: „Bounded Context“







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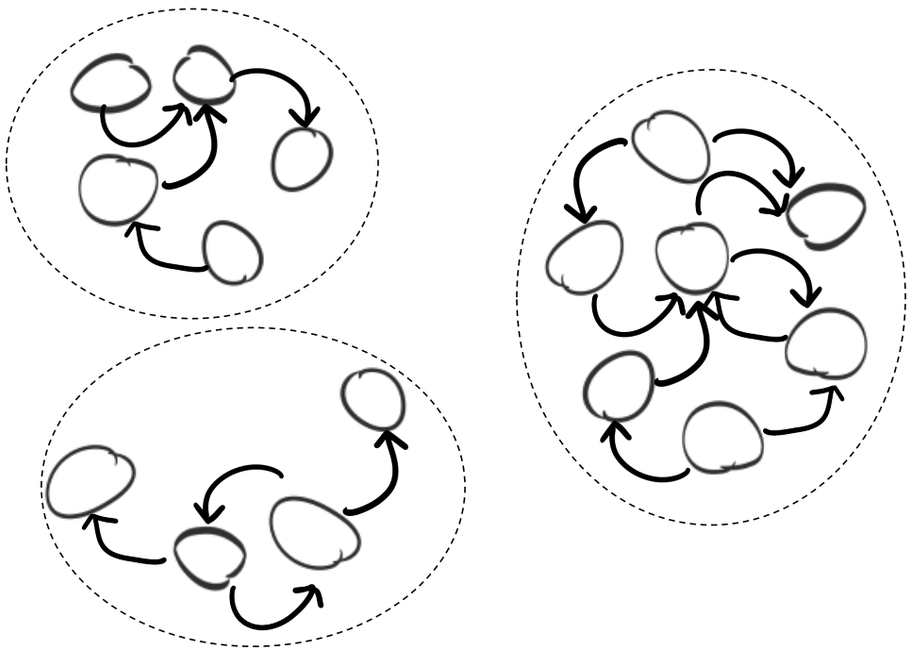

Bounded Context, aber wie?

- Klare Grenzen
- Business-Prozesse
- Inkonsistenzen vermeiden

- e.g. „check out“
- e.g. „present product“
- e.g. „my recommendations“

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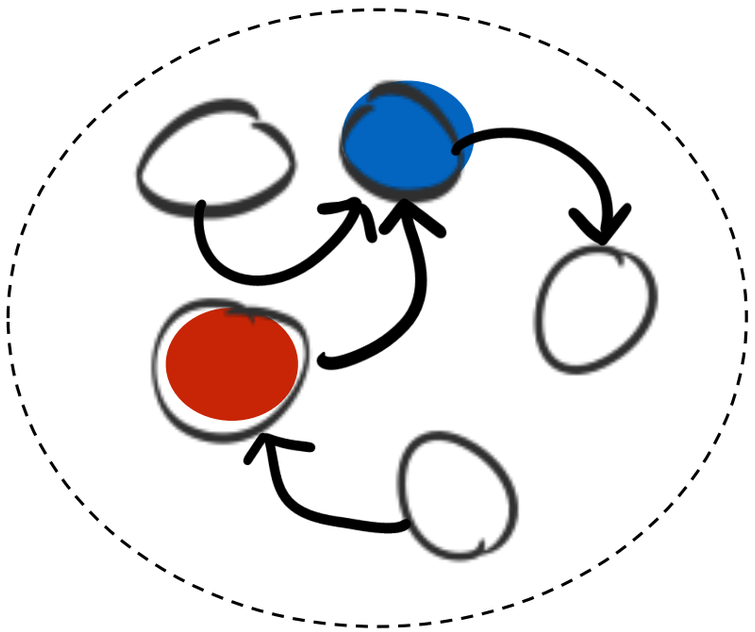
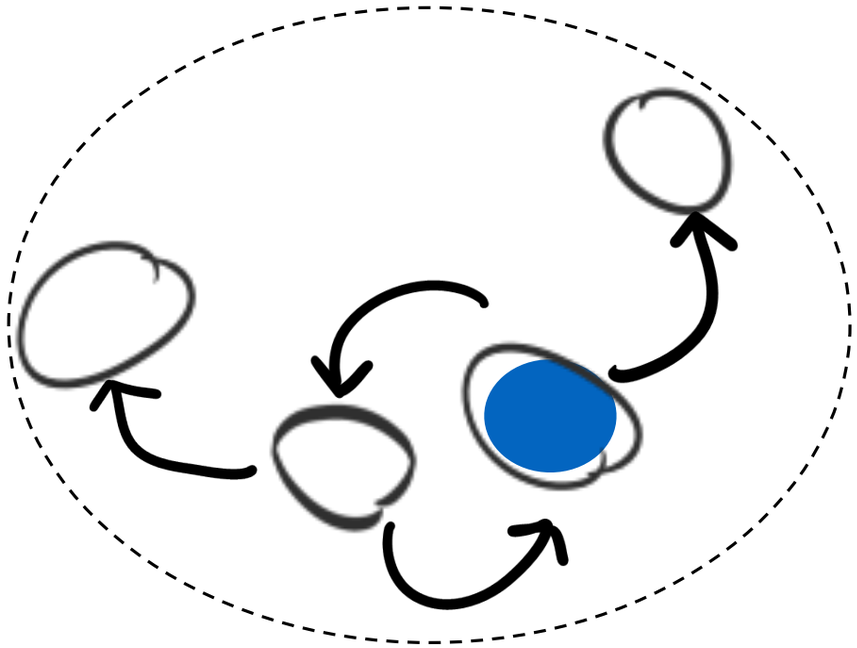
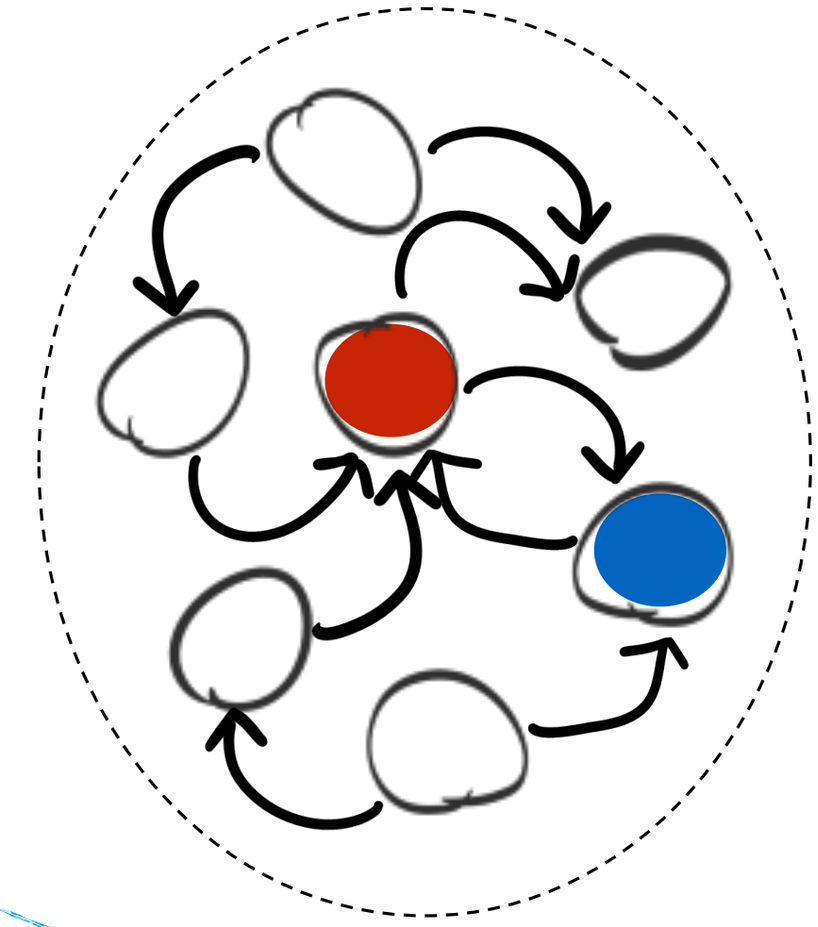




Abhängigkeiten?



„Know your Neighbors!“

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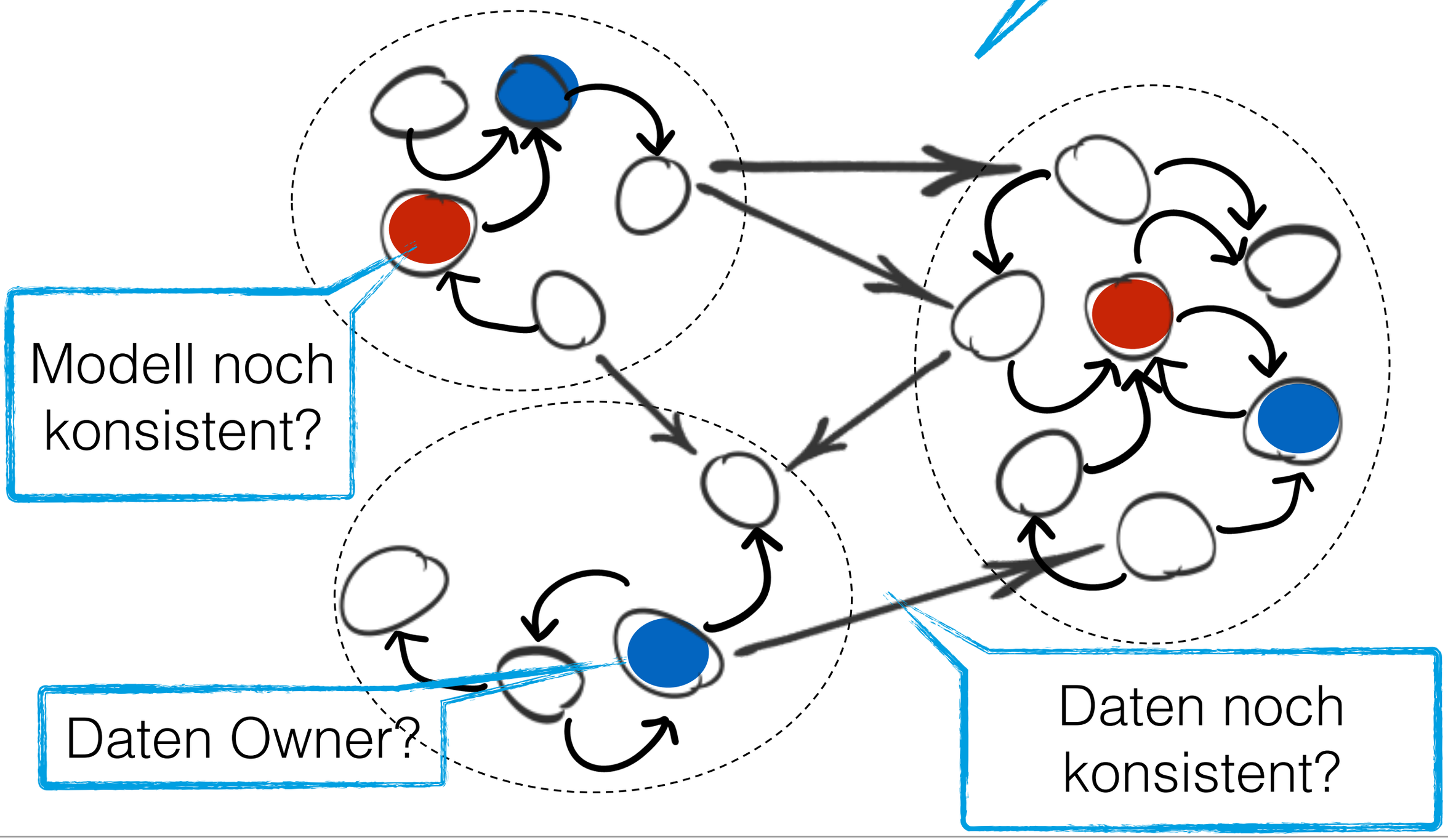
Context Map



„Starbucks does not use

Two-Phase Commit“

http://www.enterpriseintegrationpatterns.com/ramblings/18_starbucks.html

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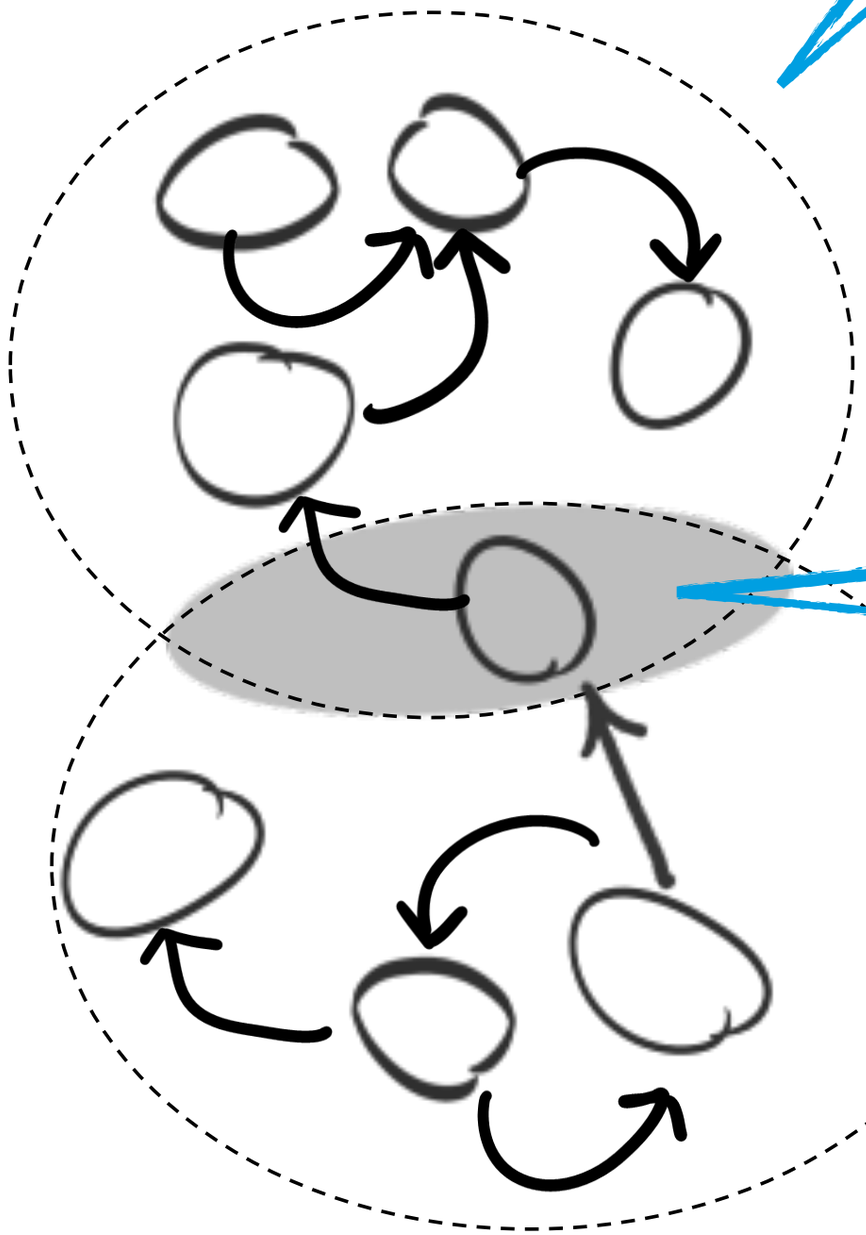
Shared Kernel



Meins? Deins?

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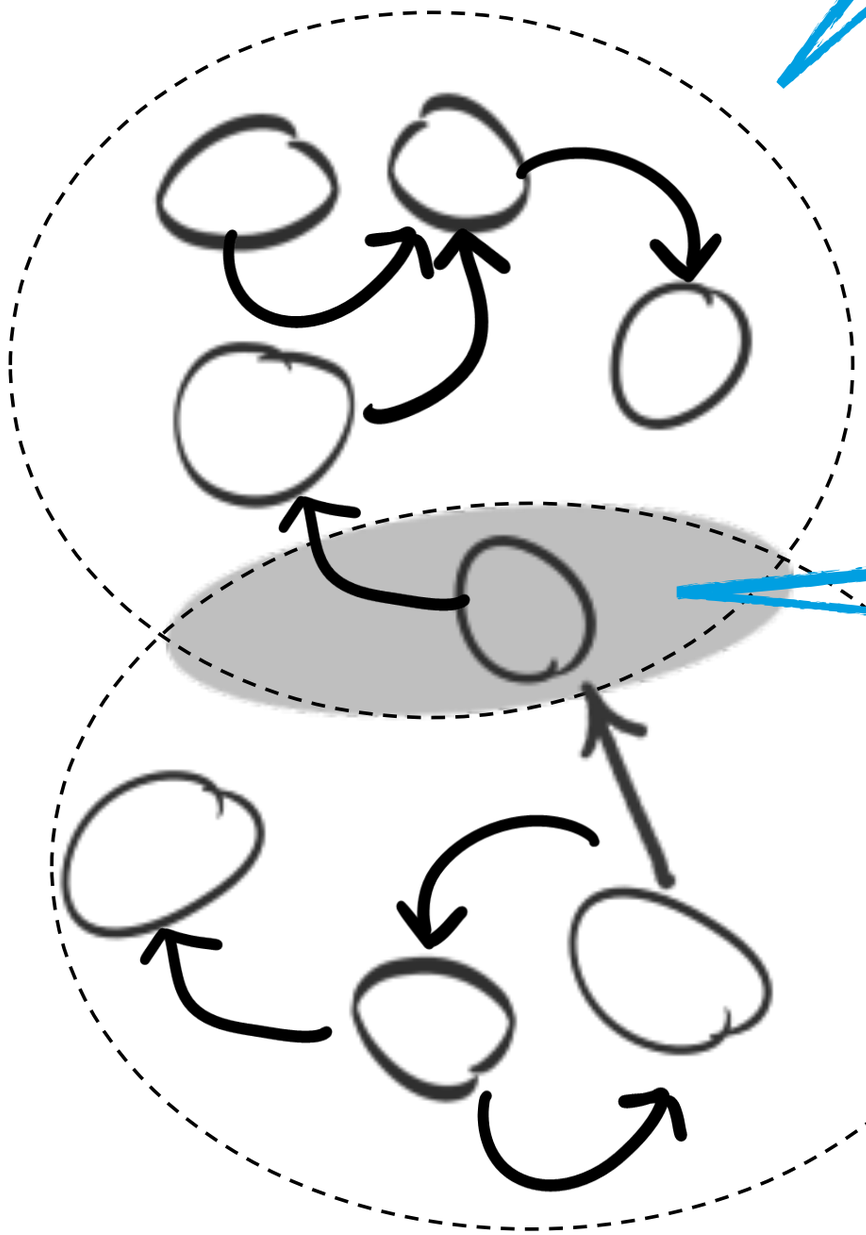
Shared Kernel



Versionierung?

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Versionierung?

„Be **conservative** in what you do, be **liberal** in what you expect.“

Postel’s Law (a.k.a. robustness principle)

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Versionierung?

Best Practices: **strategic**

- nicht forcieren
- „closely coupling“ vermeiden
- Consumer-Driven Contracts

- Semantic Versioning (Major.Minor.Patch)
- Koexistenz mehrerer Endpoints
- Koexistenz mehrerer Service-Versionen

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Versionierung?

Best Practices: **technical**

- gar nicht (via „ignorieren“)
- gar nicht (via „zusätzliche Ressourcen“)
- gar nicht (via „erweiterbare Datenformate“)

- Versionsnummer in der URL
- Versionsnummer im Header (via Custom-Header)
- Content Negotiation (via Accept-Header)

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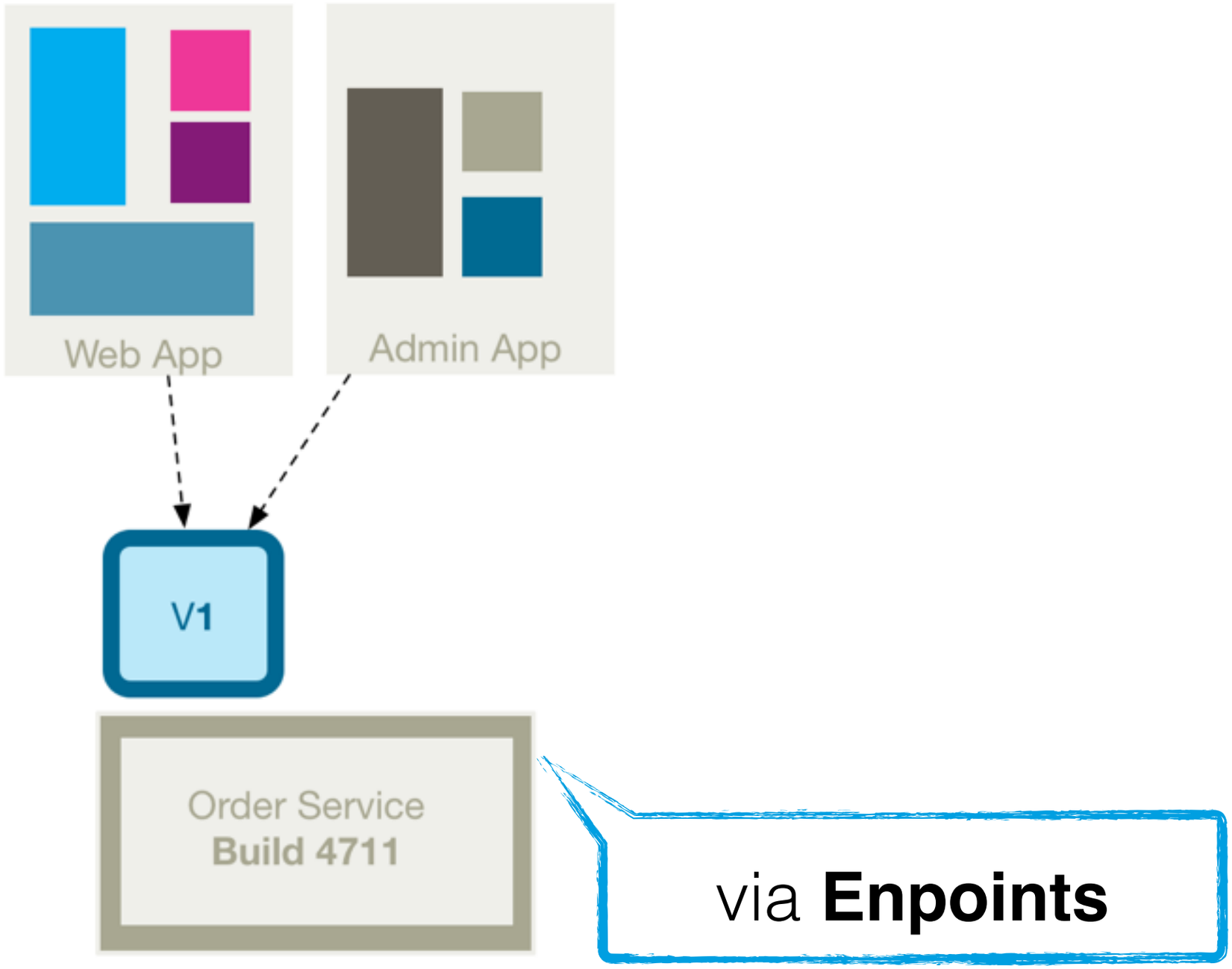

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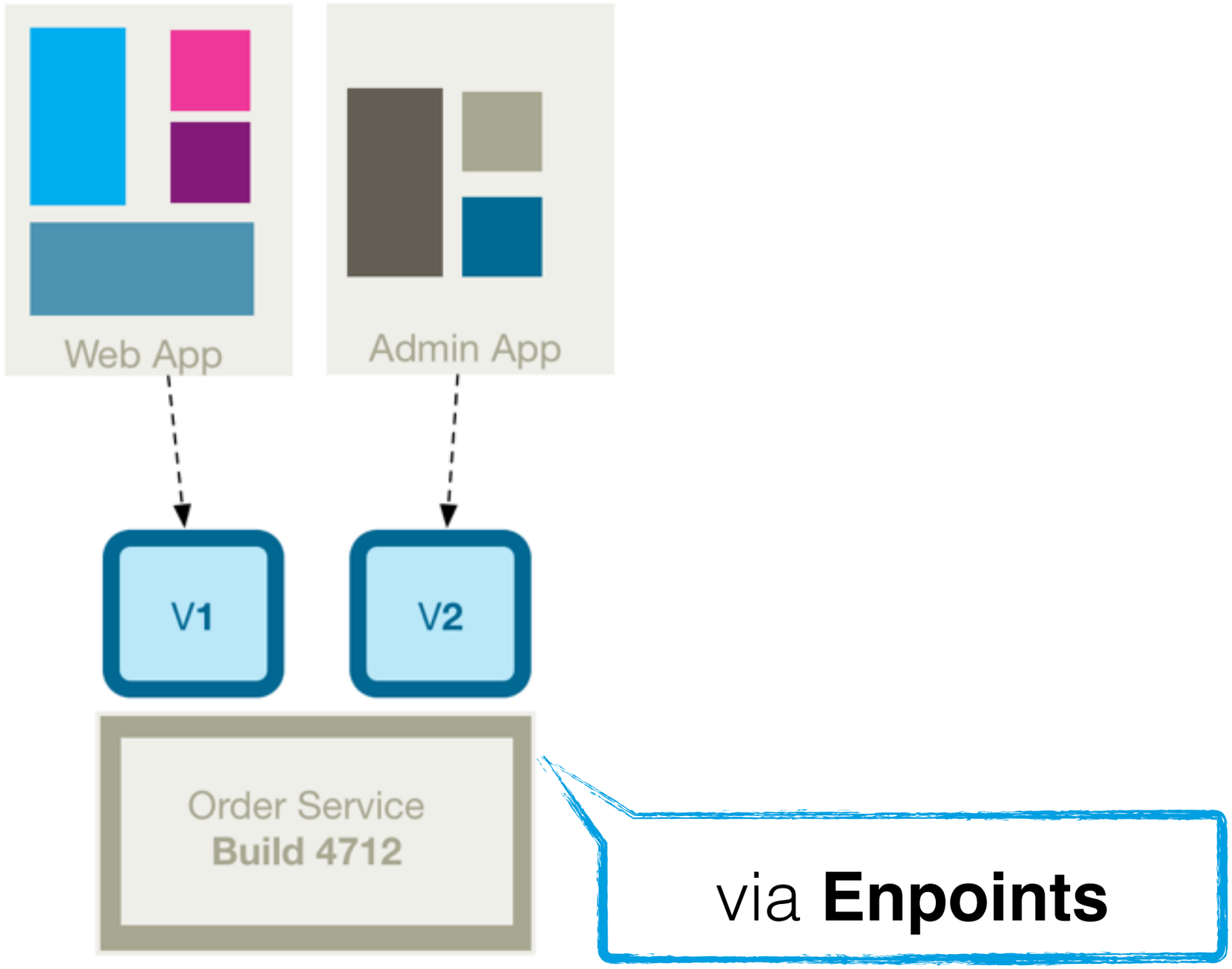

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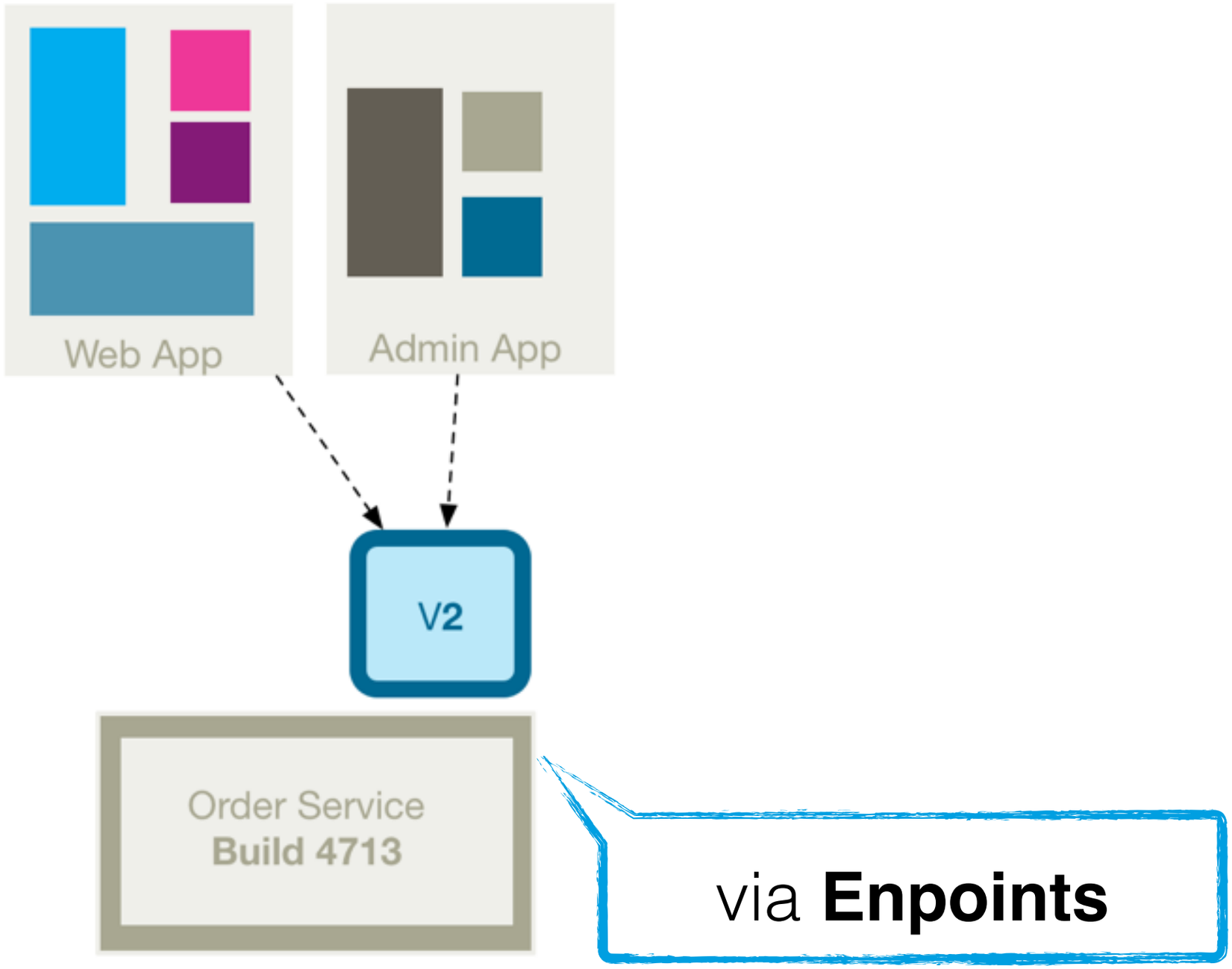

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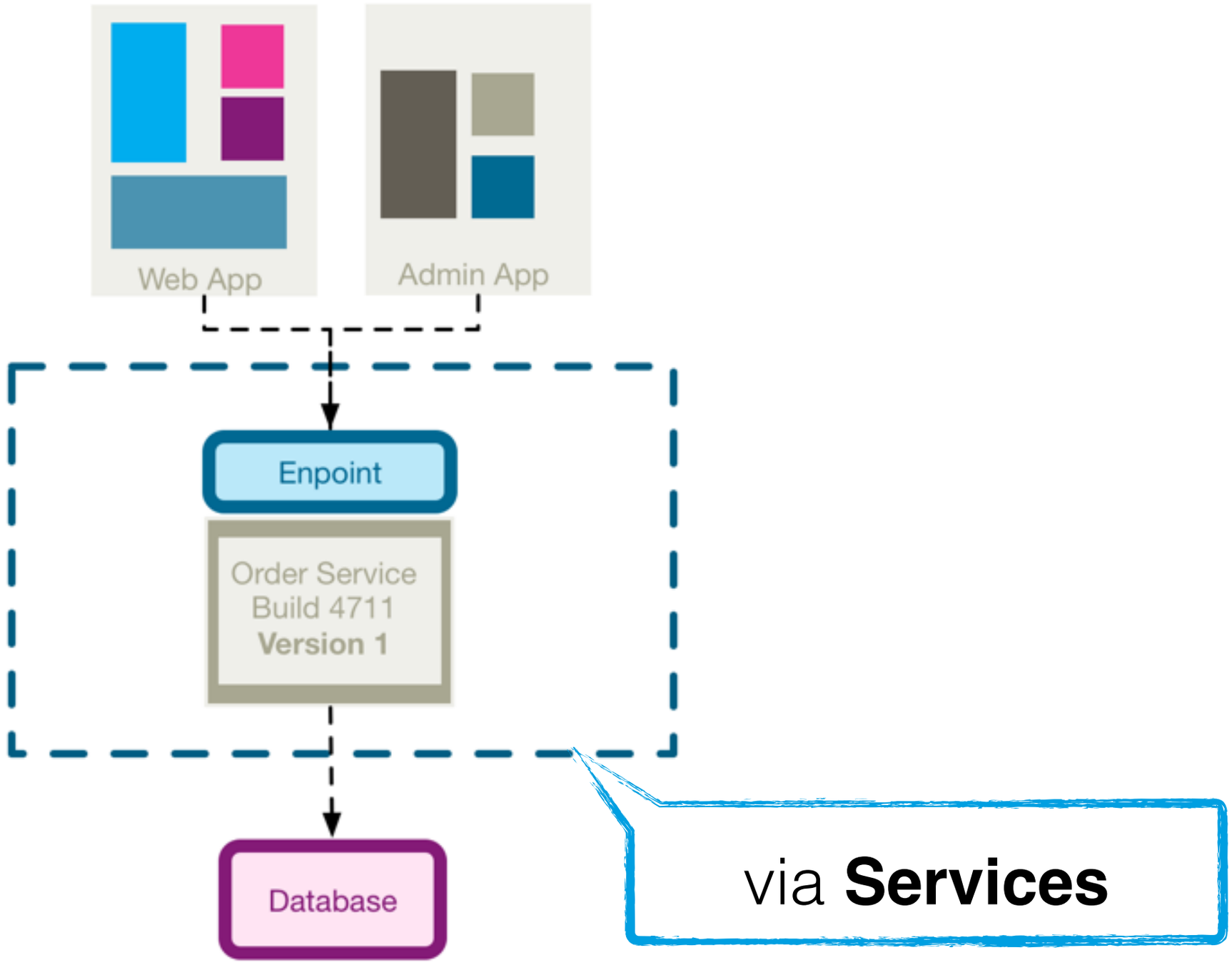

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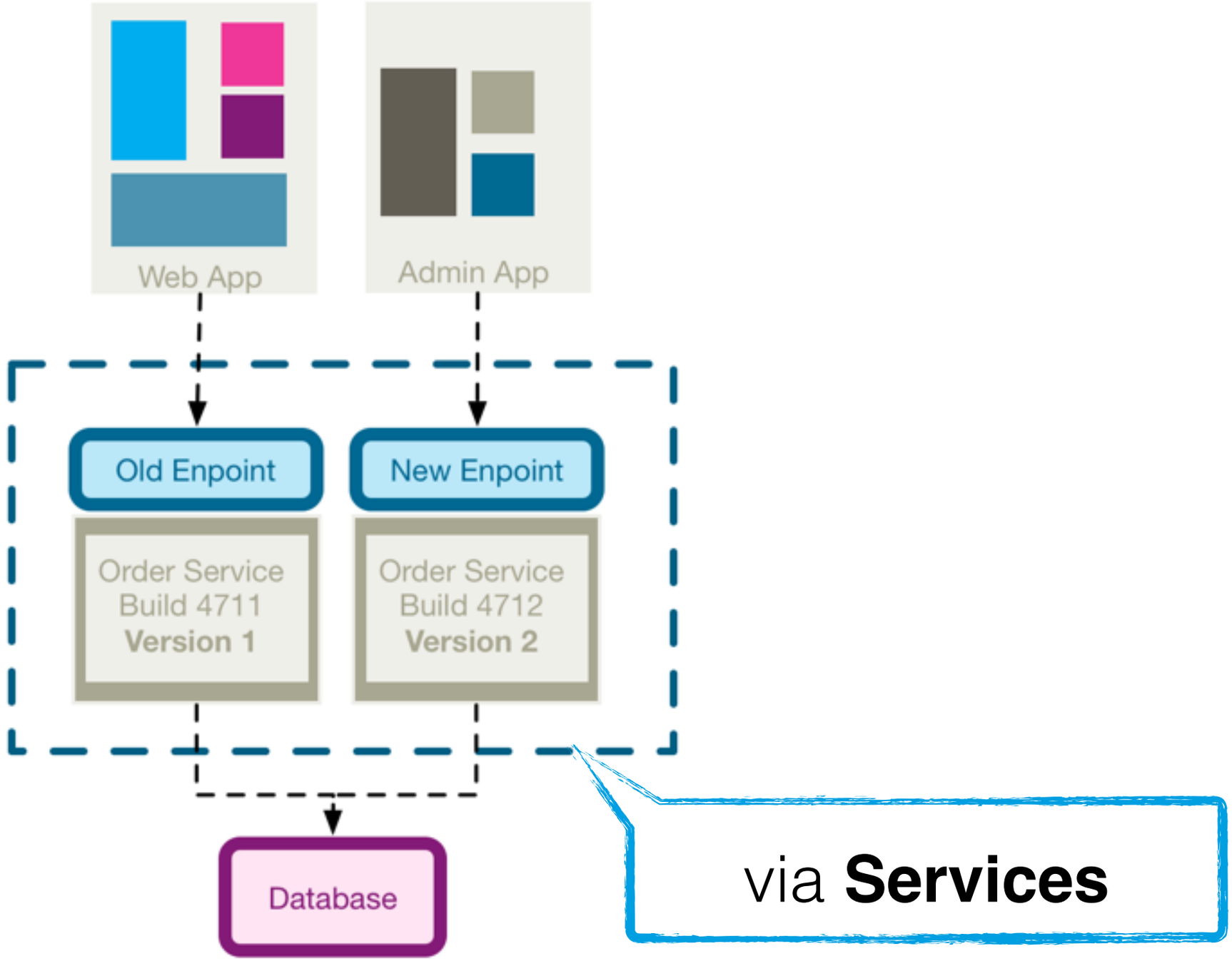

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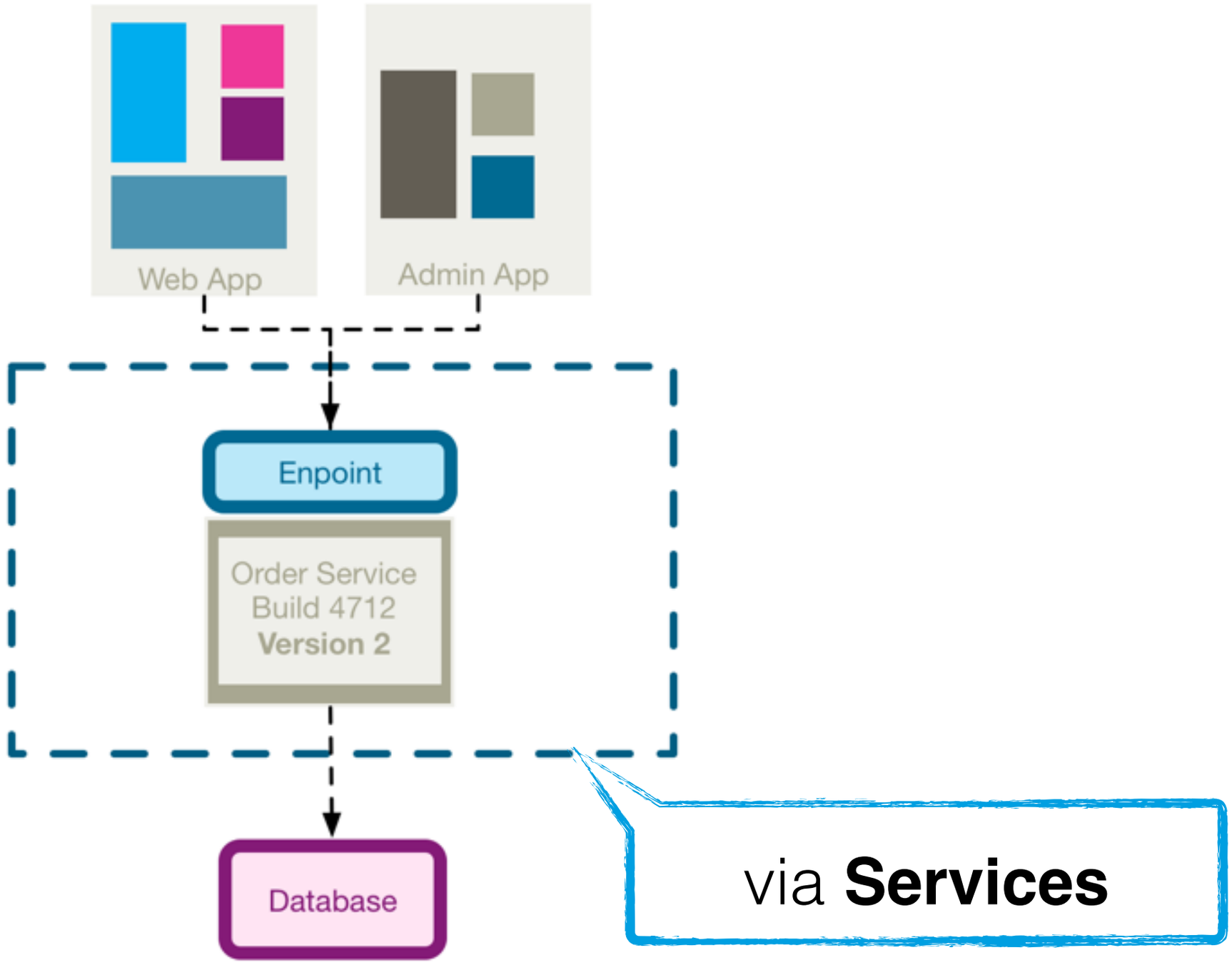

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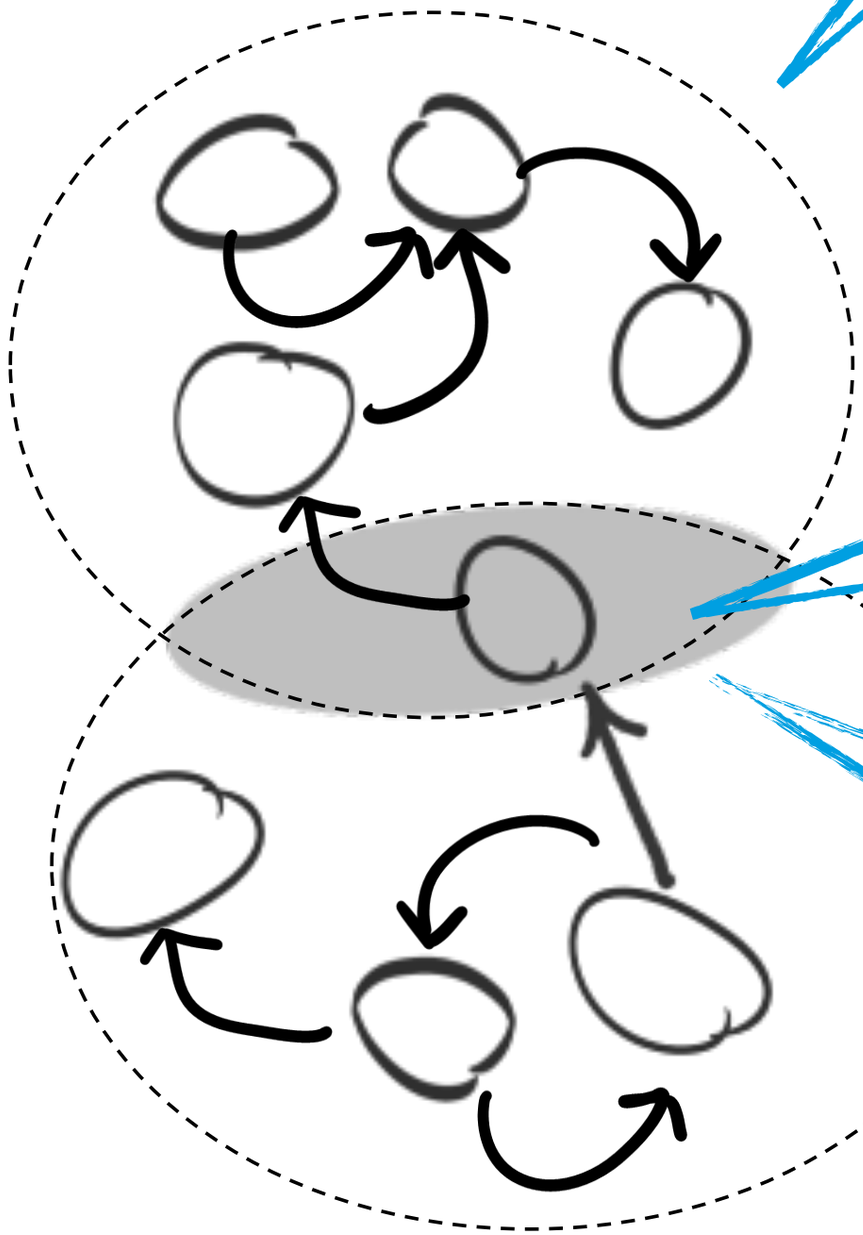
Shared Kernel



Ich auch!

Ich brauche das!

Und ich auch!

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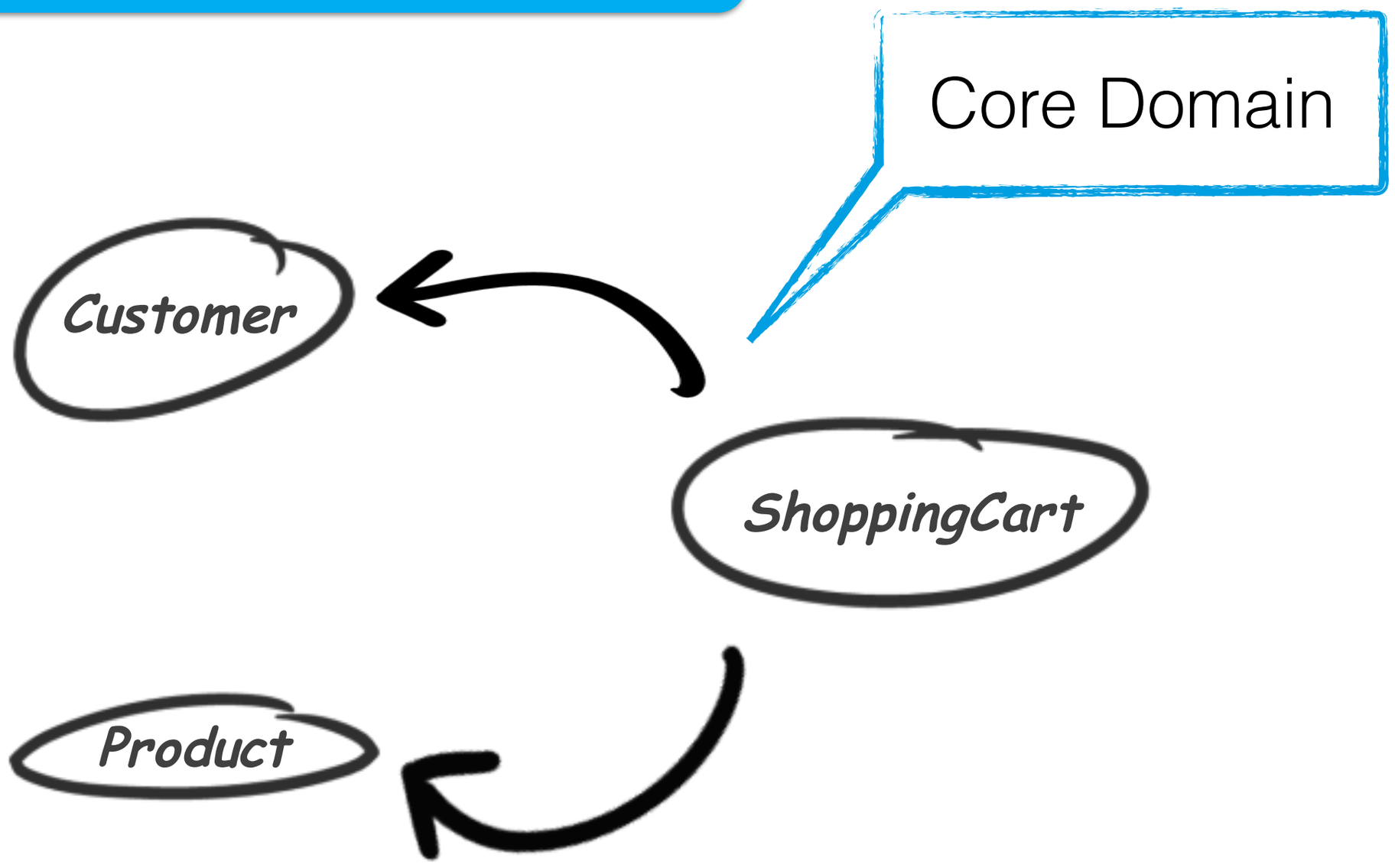

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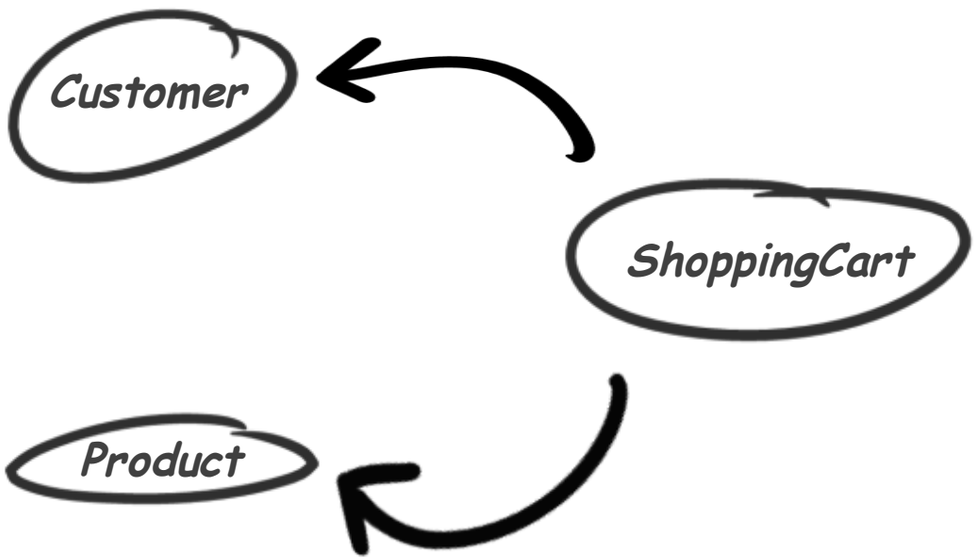

Core Domain

- fachliche Basis
- saubere Modellierung
- div. Repräsentationen
- zur Kommunikation
- i.d.R. nur wenige Attribute

- Trennen von „common“

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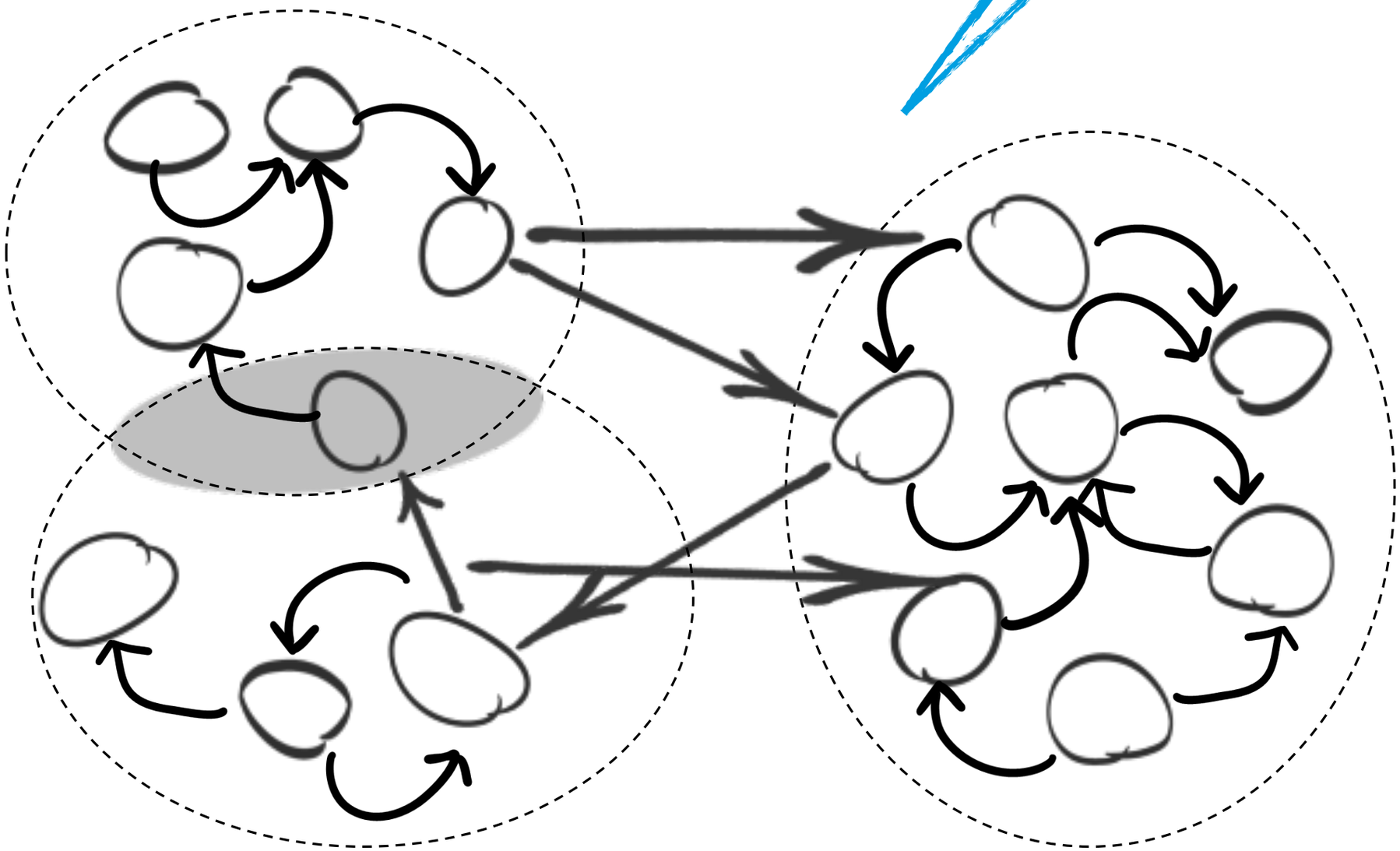
Evolution?



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http://techblog.netflix.com/2013/01/announcing-ribbon-tying-netflix-mid.html

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„A Microservice never walks alone!“

me, myself and I (2015)

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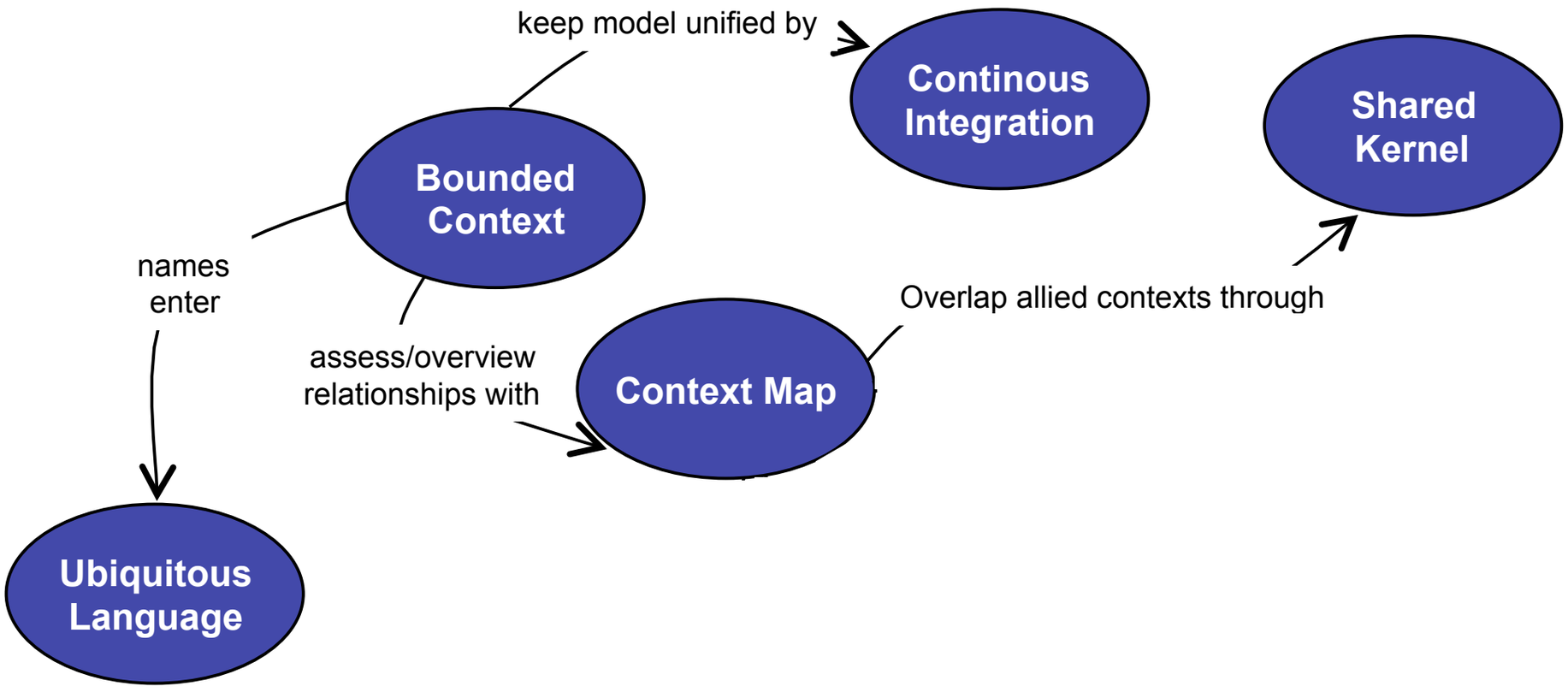

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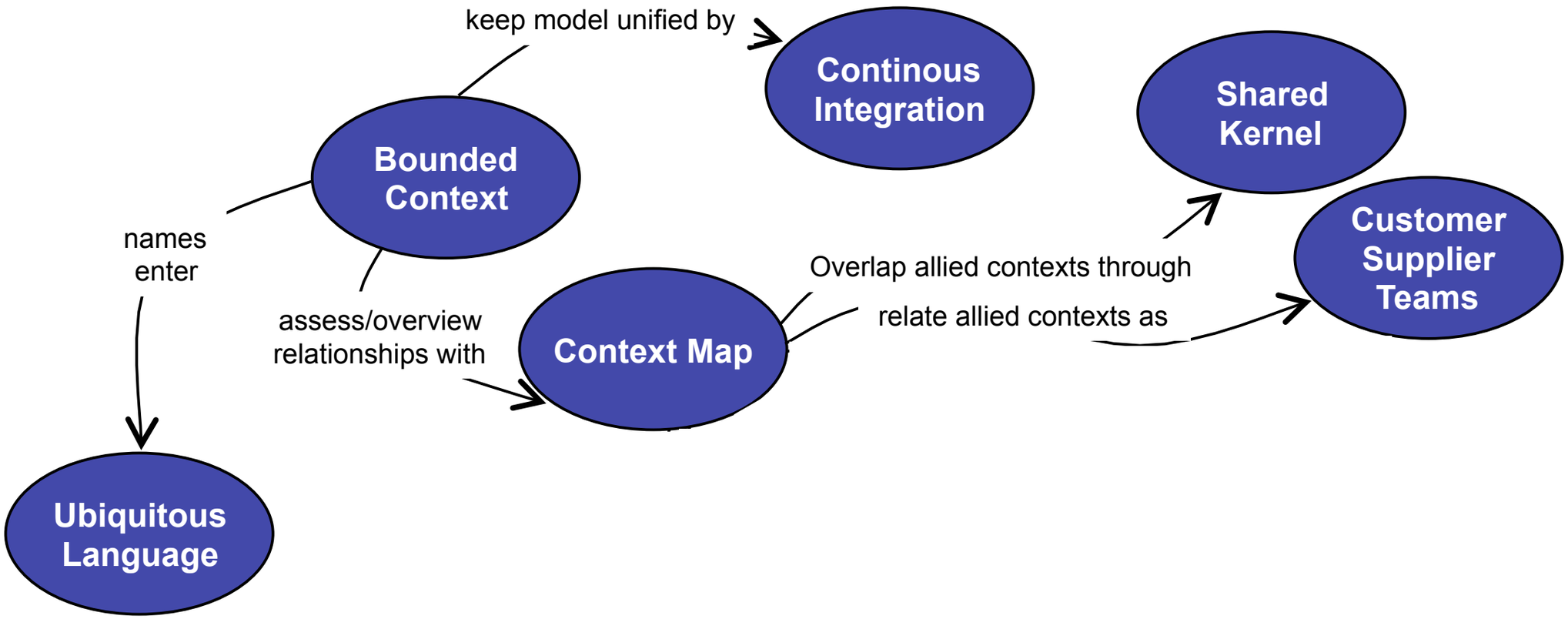

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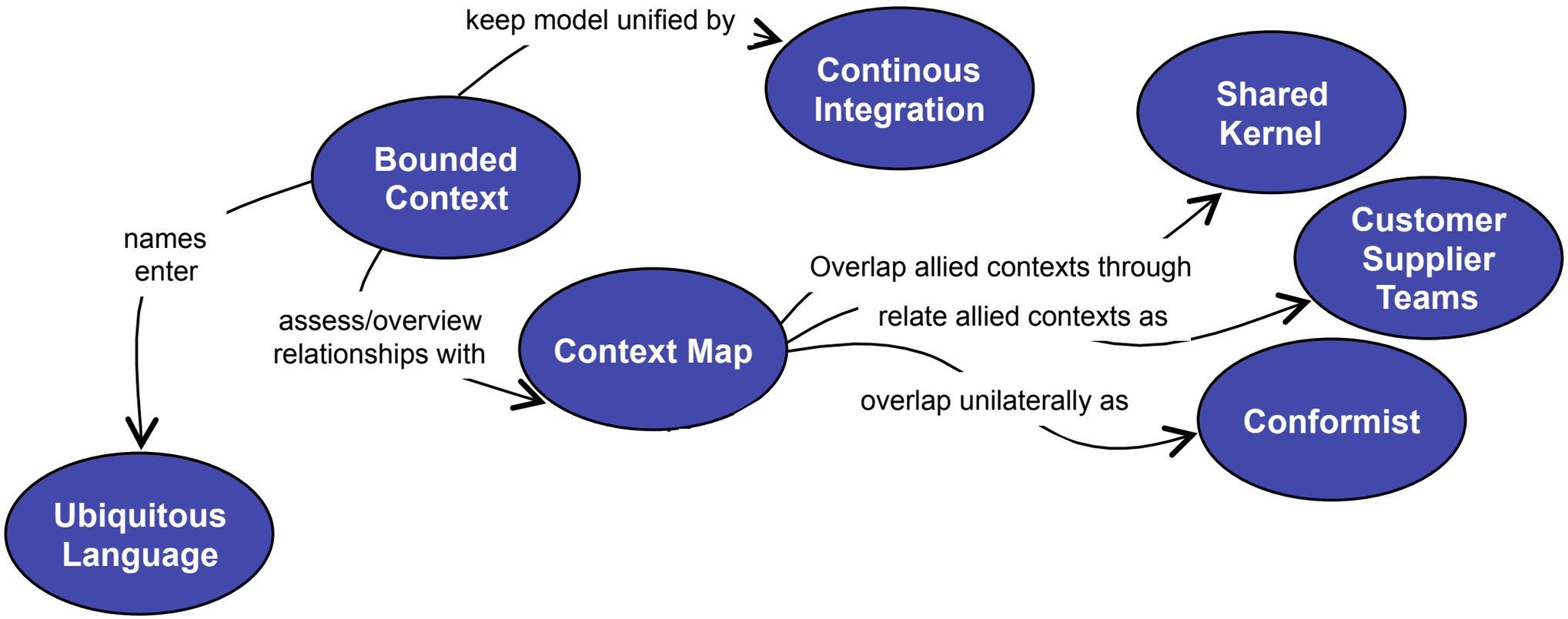

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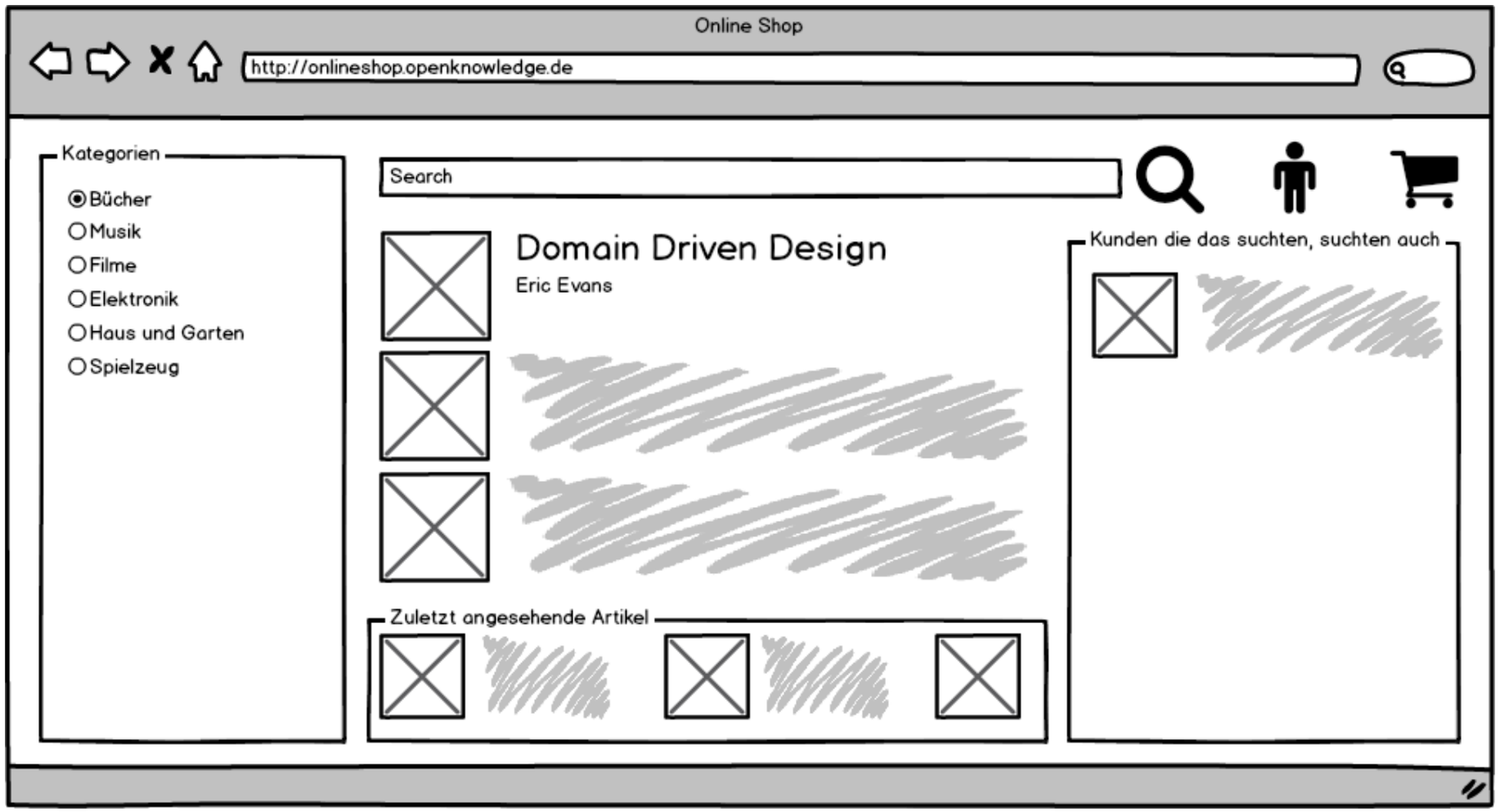
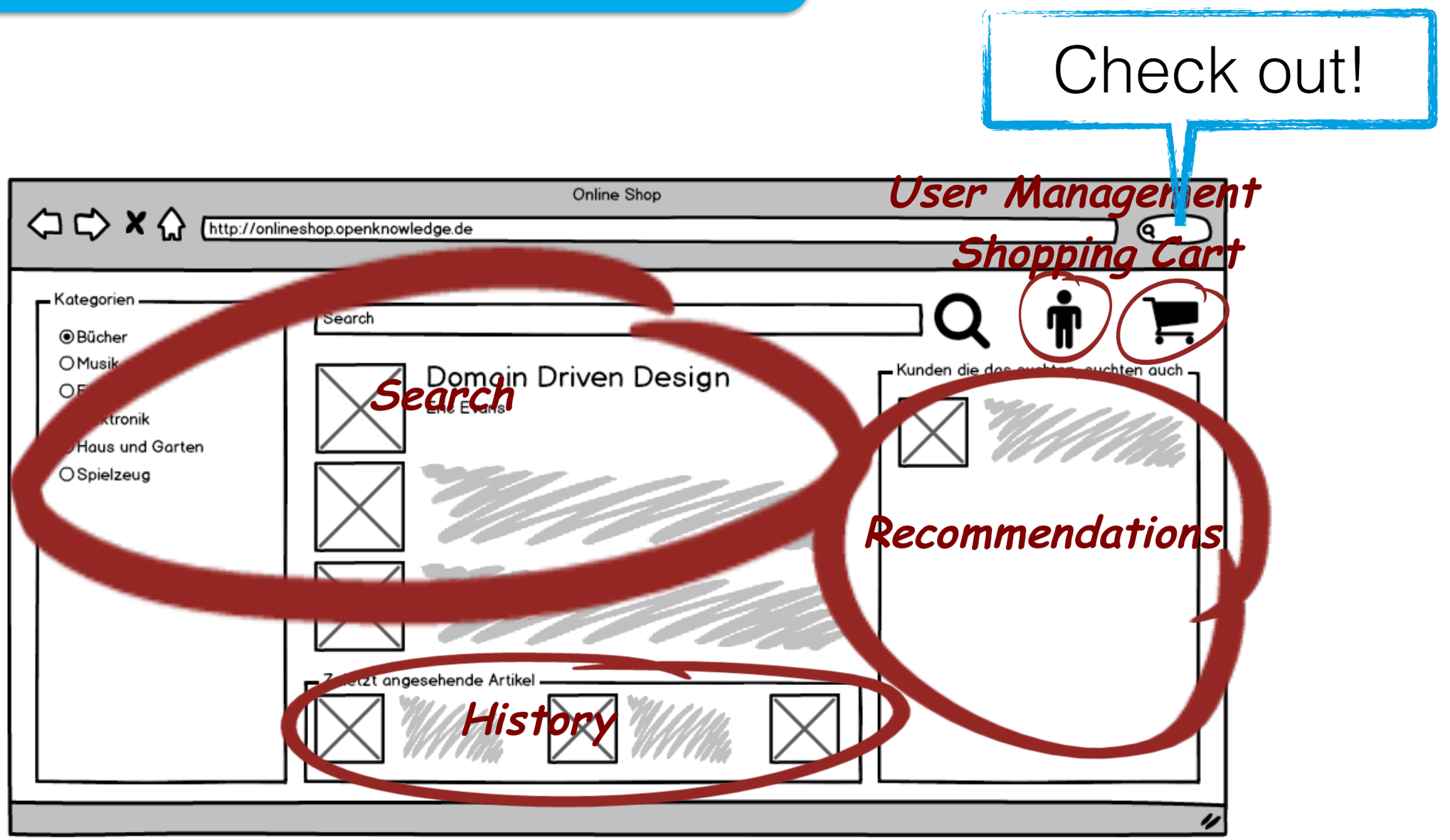
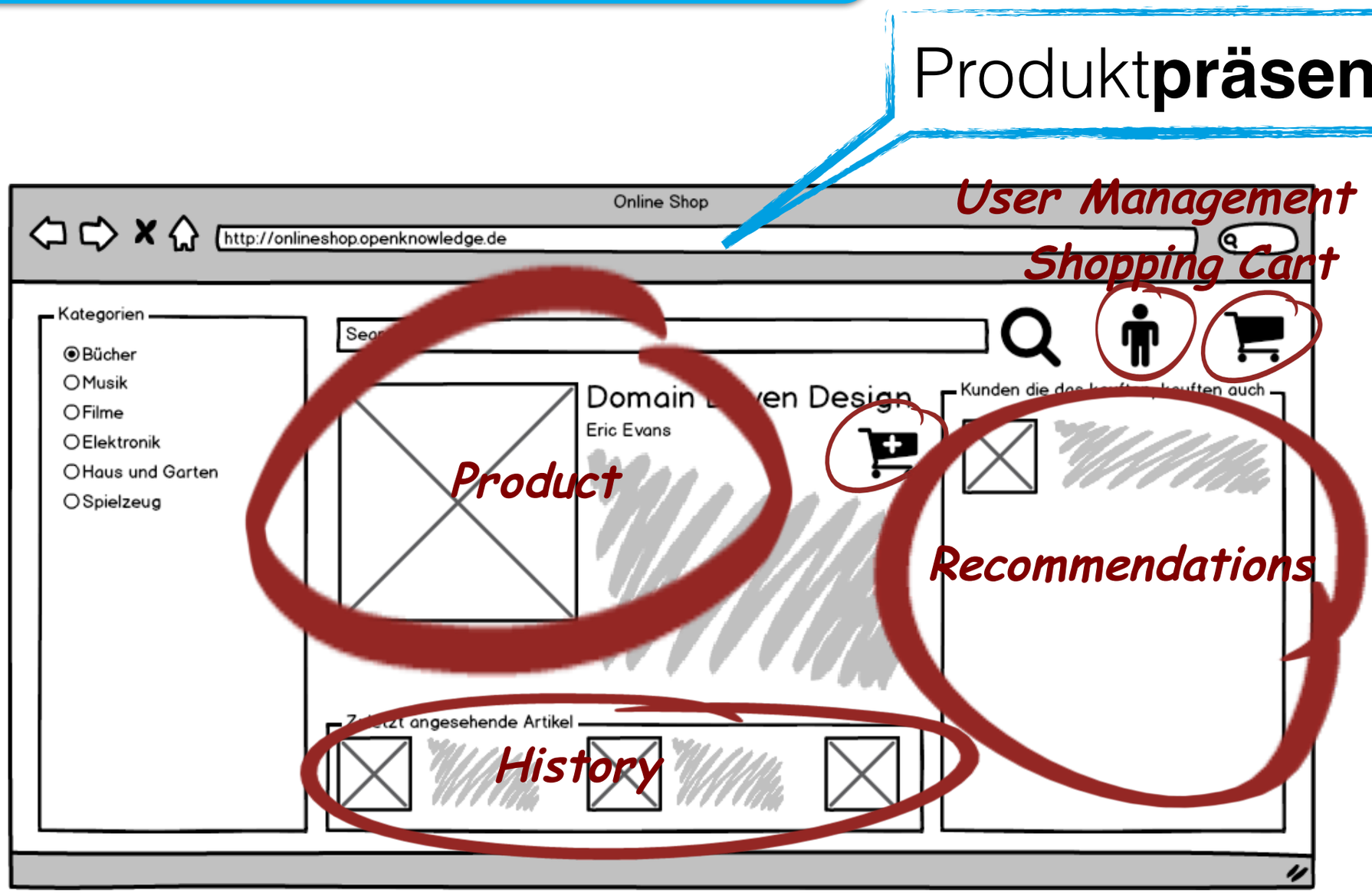
Microservices?



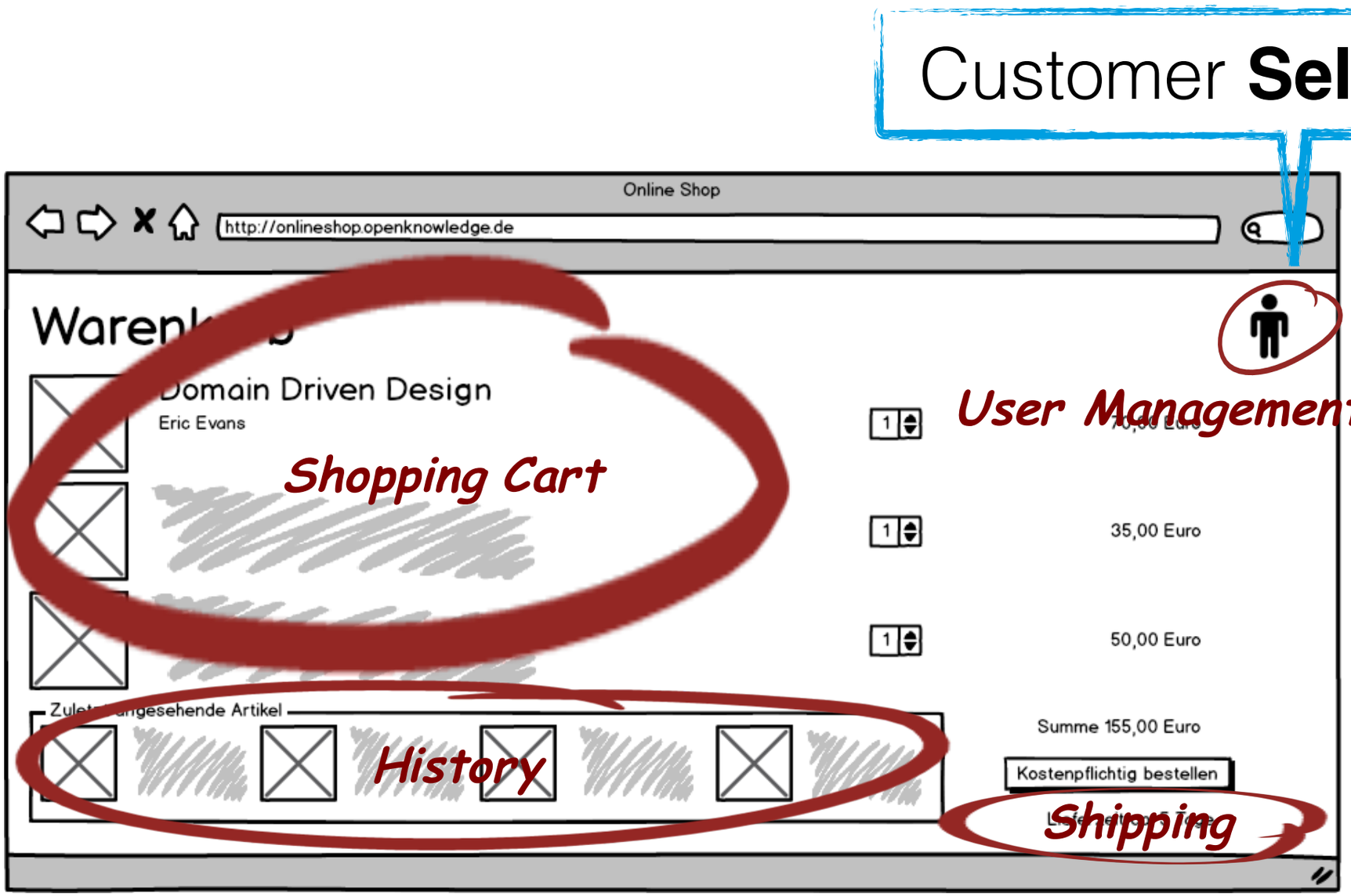
Surviving Service Design



Surviving Service Design



Surviving Service Design



Size does(n’t) matter

Eine subjektive Einschätzung

Meine Sicht der Dinge

- „Verwende eine **gemeinsame Sprache**“
- „Kenne dein **Domain Model**“
- „Kenne deine **Bounded Contexts**“
- „Kenne deine **Nachbarn**“
- „Denke in **Prozessen**, nicht in **Objekten**“
- „Sei **toleranter Reader** und **strikter Supplier**“
- BTW: „**Miteinander reden** ist weiterhin erlaubt!“

Bildnachweise

- #1: iStock.com / Andrew Rich (000029536120)
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