

Real World Examples of Microservices Architecture & Implementation

Vidya Vrat Agarwal

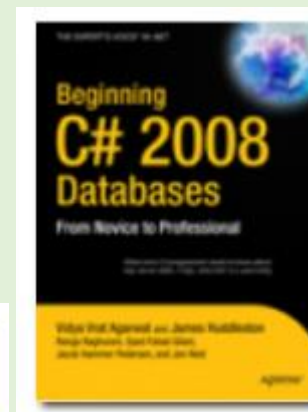
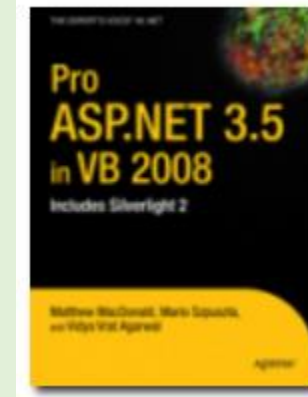
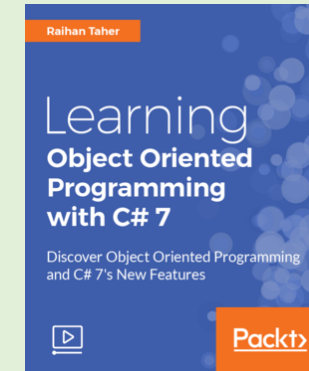
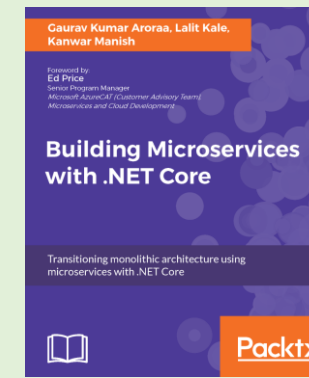
Principal Architect T-Mobile

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About Me

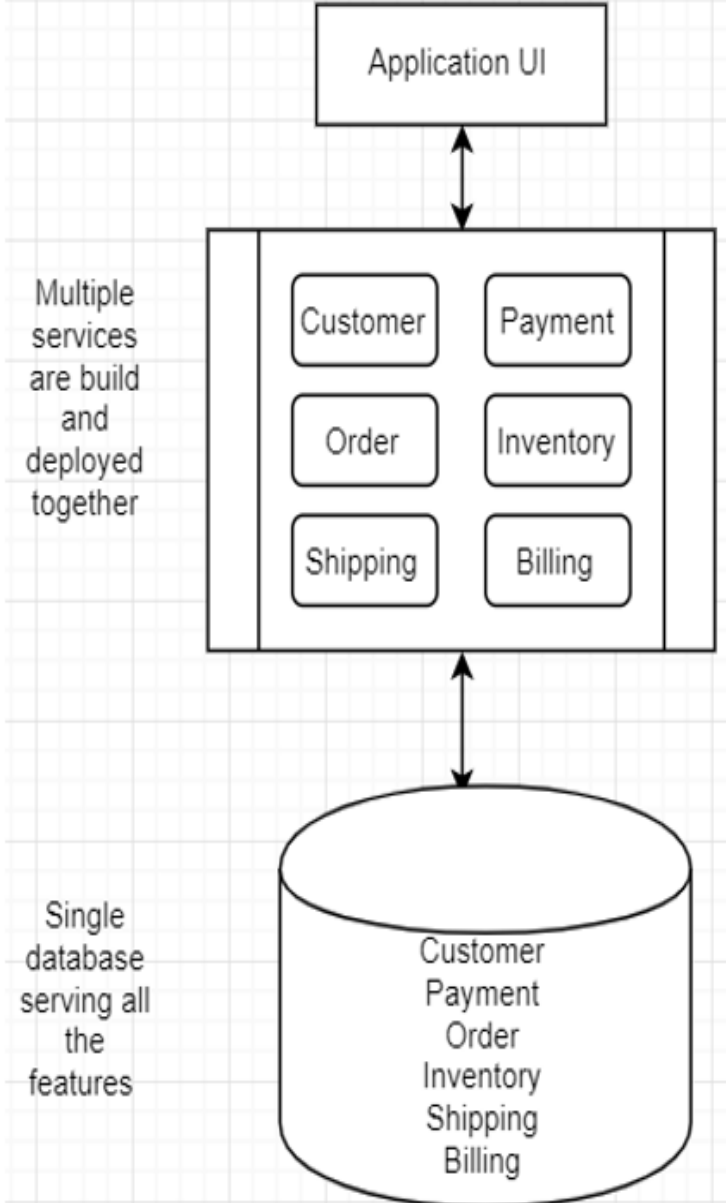
- 20+ years of industry experience
- Working as Principal Architect with T-Mobile
- Microsoft MVP
- C# Corner MVP
- TOGAF Certified Architect
- Certified Scrum Master (CSM)
- Microsoft Certified (MCT, MCSD / MCAD .NET, MCTS etc.)
- Published Author (5) and Technical Reviewer (over a dozen)



Monolith (SOA)

- An application which is developed, build and deployed as a single unit, and for almost all the times a single data store is used for the application.

Monolith Architecture



Microservice

- A “Microservice is a small autonomous, tightly scoped, loosely coupled, independently deployable, and independently scalable application component.”
- Global Microservice Architecture Market anticipated accreting to US\$ 33 Billion by 2023.

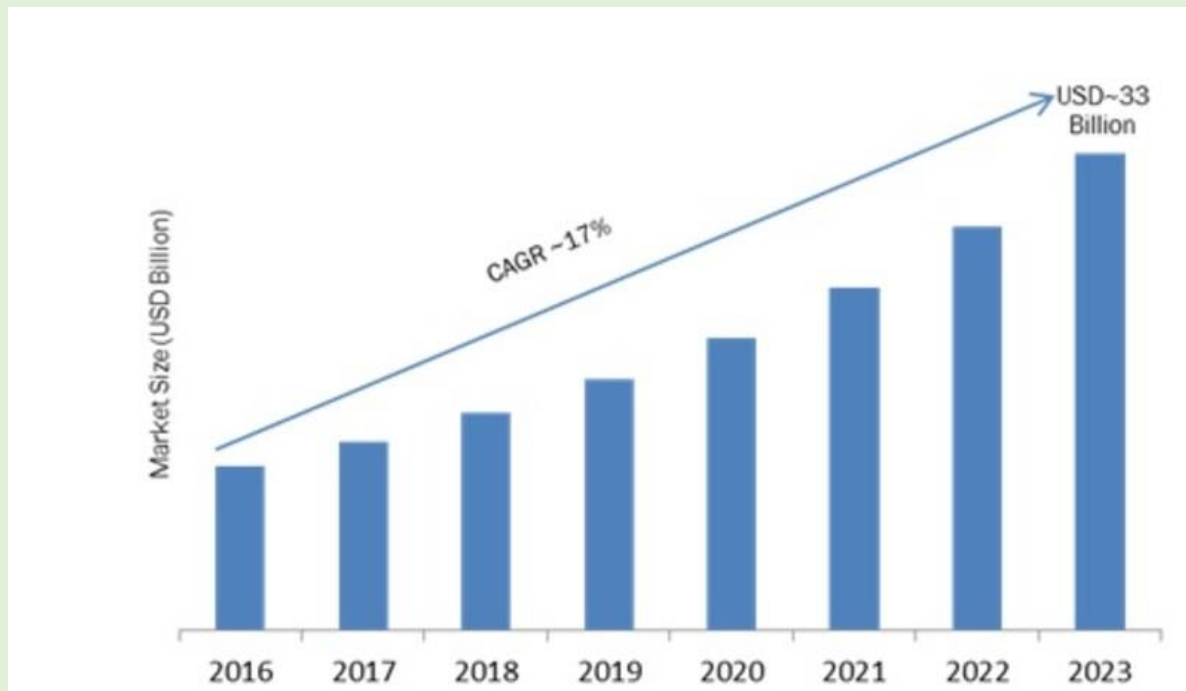
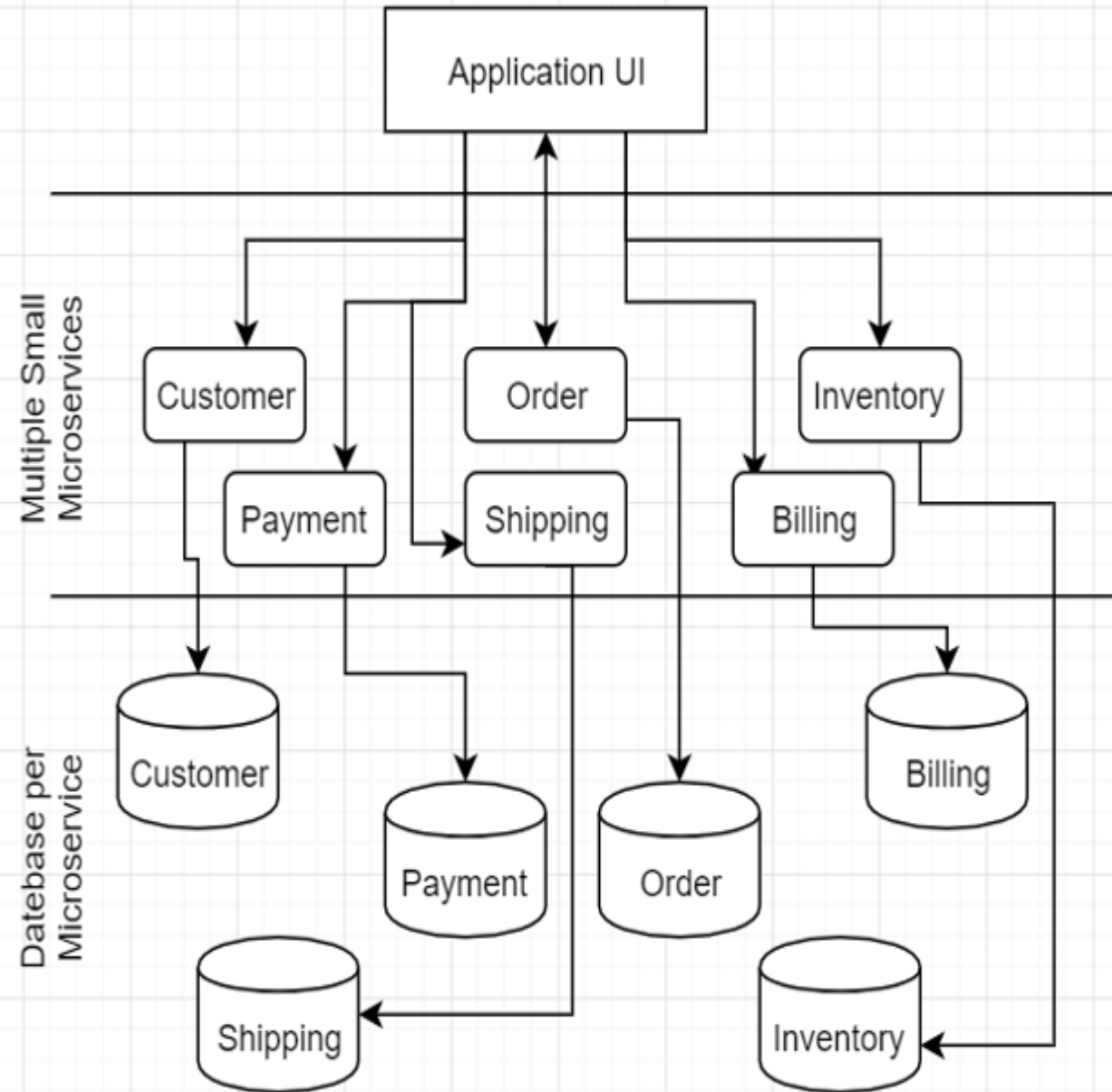


Image Reference - <https://www.marketresearchfuture.com/reports/microservices-architecture-market-3149>

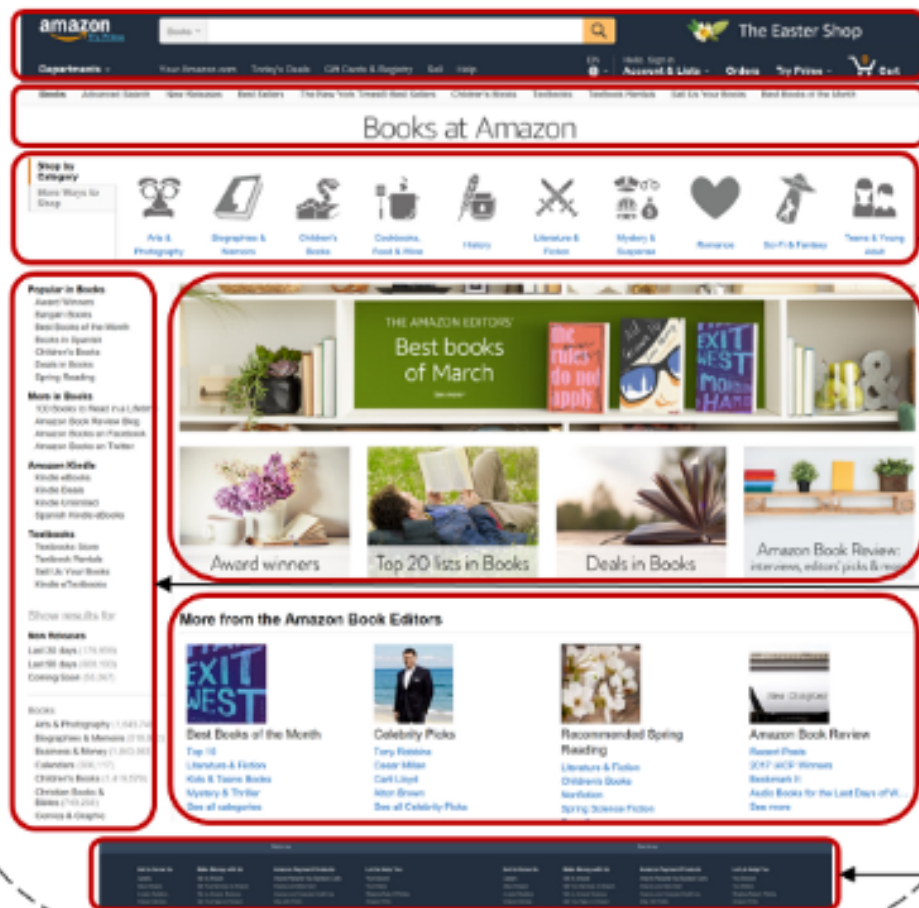
Microservice Architecture



Pros-n-Cons of Microservice

- Scalability
- Easier Deployments
- Problem isolation
- Single Responsibility
- Polyglot programming
- Cultural Change
- More Expensive
- Complexity
- Less Productivity

Composite UI



Backend Microservices

Composed
ViewModel

Composed
ViewModel

Composed
ViewModel

Composed
ViewModel

Composed
ViewModel

Composed
ViewModel

UI Composition
Microservice 1



Container

UI Composition
Microservice 3



Container

UI Composition
Microservice 5



UI Composition
Microservice 6



JSON
DTOs

JSON
DTOs

JSON
DTOs

UI Composition
Microservice 2



UI Composition
Microservice 4



UI Composition
Microservice 6



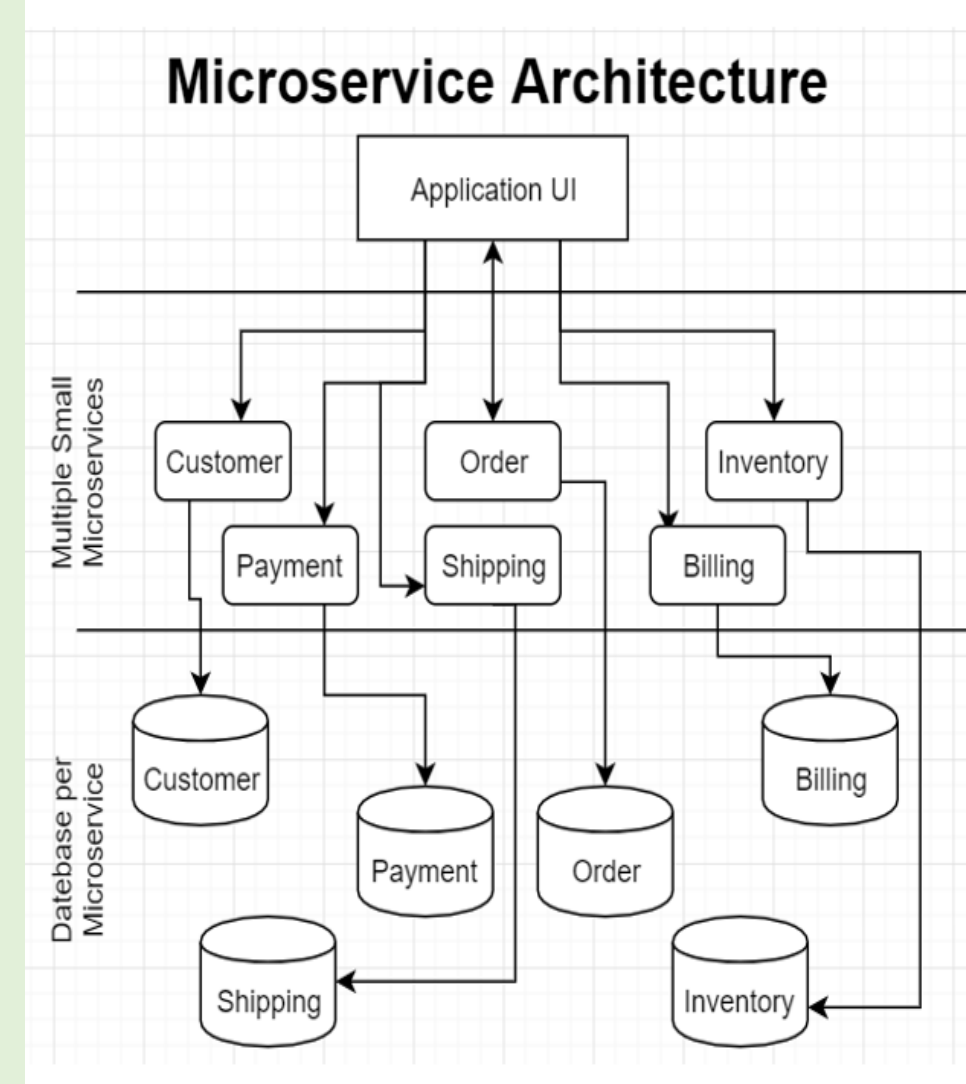
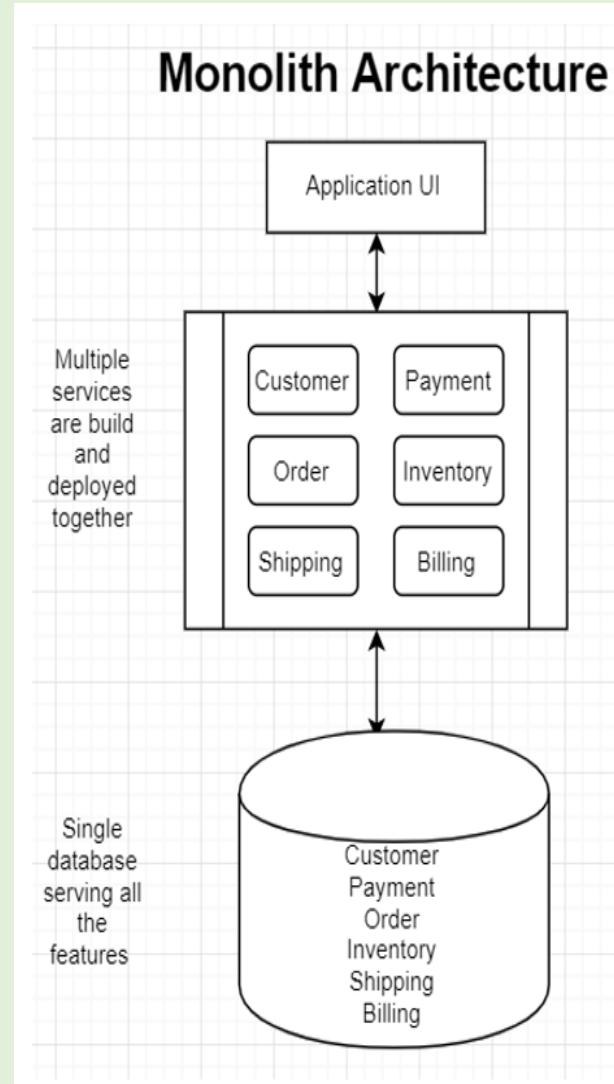
Other internal
microservices



Finding a Bounded Context

A bounded context is an explicit boundary within which a domain model exists.

- Billing can collect payment
- Billing can own customer data
- Order can generate receipt
- Order can own inventory
- Payment can own T&Cs



Microservices

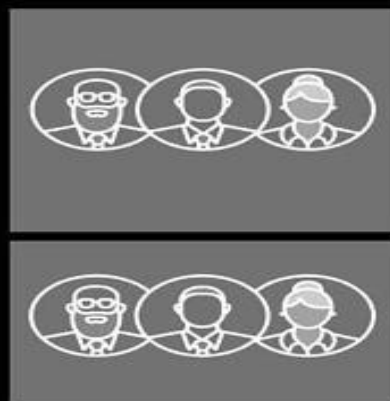
Past

The Monolith



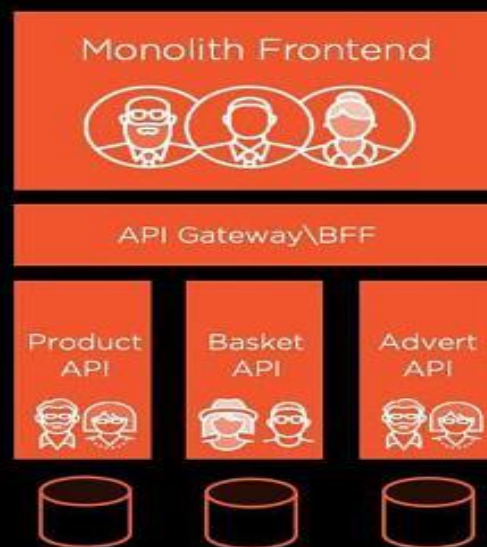
Yesterday

Frontend
+
Backend



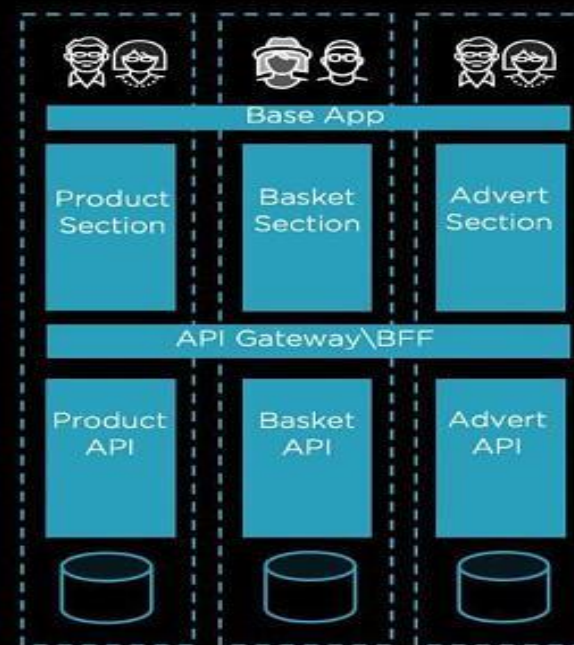
Present

Microservices



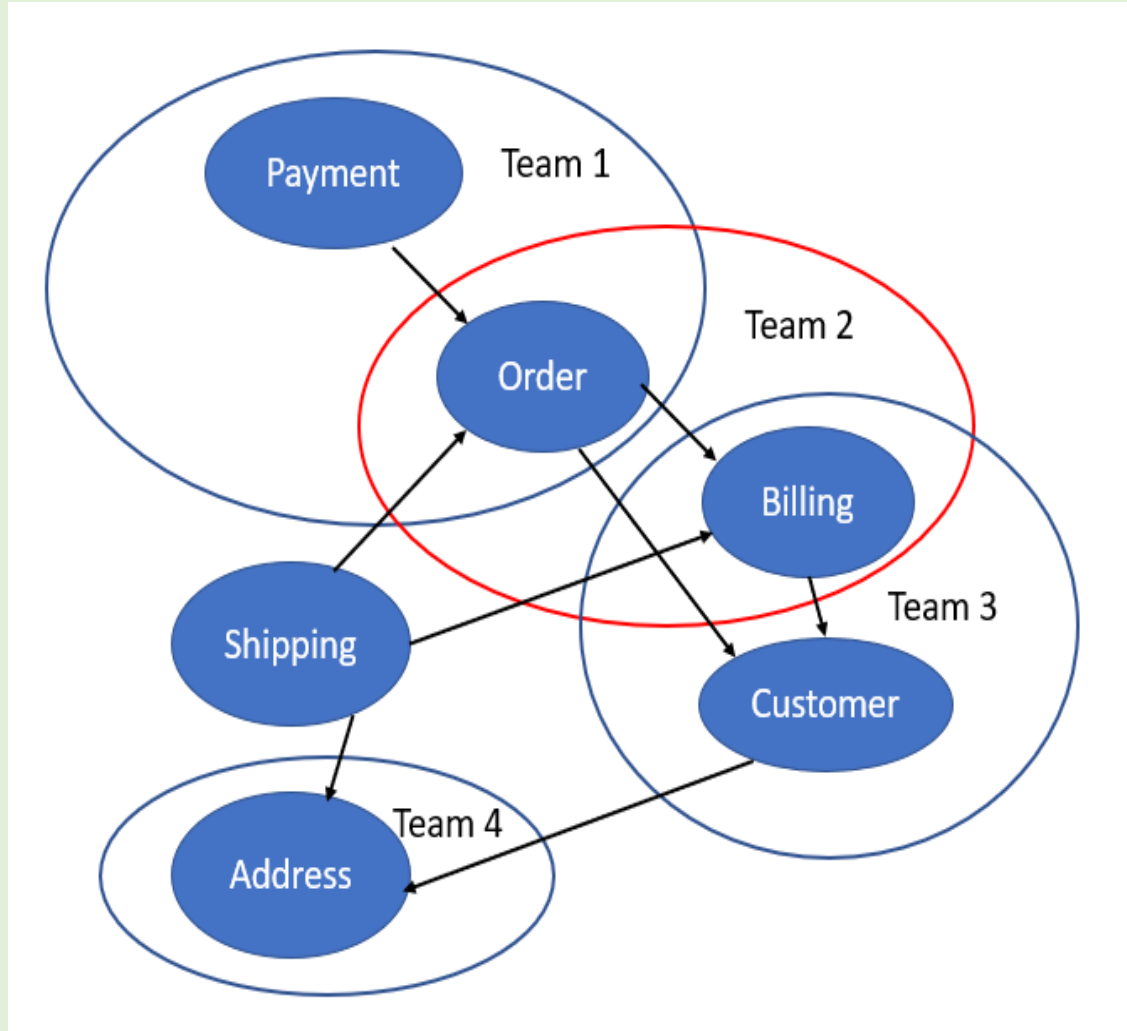
Future

Micro Frontends
+
Microservices

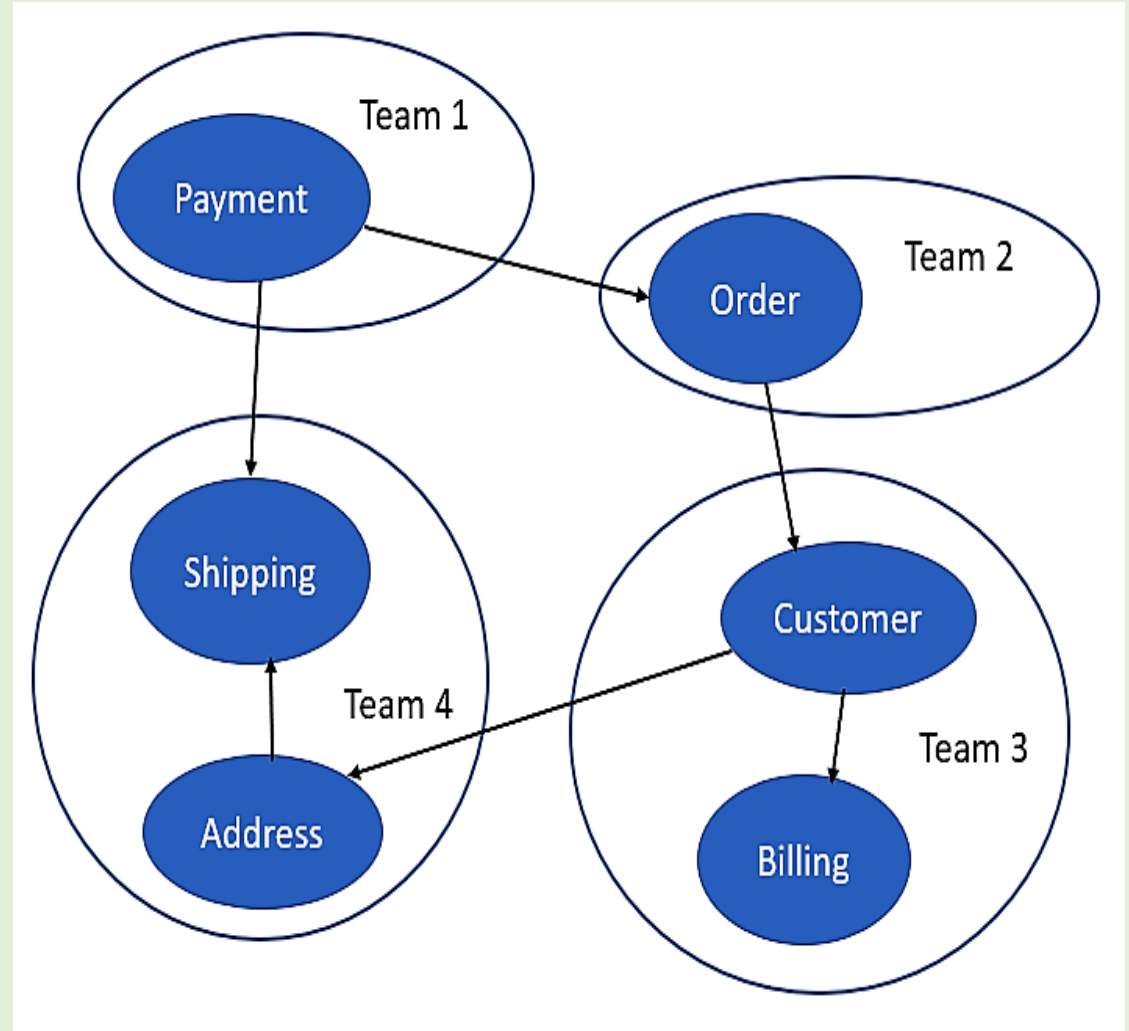


Architecture

Service Ownership



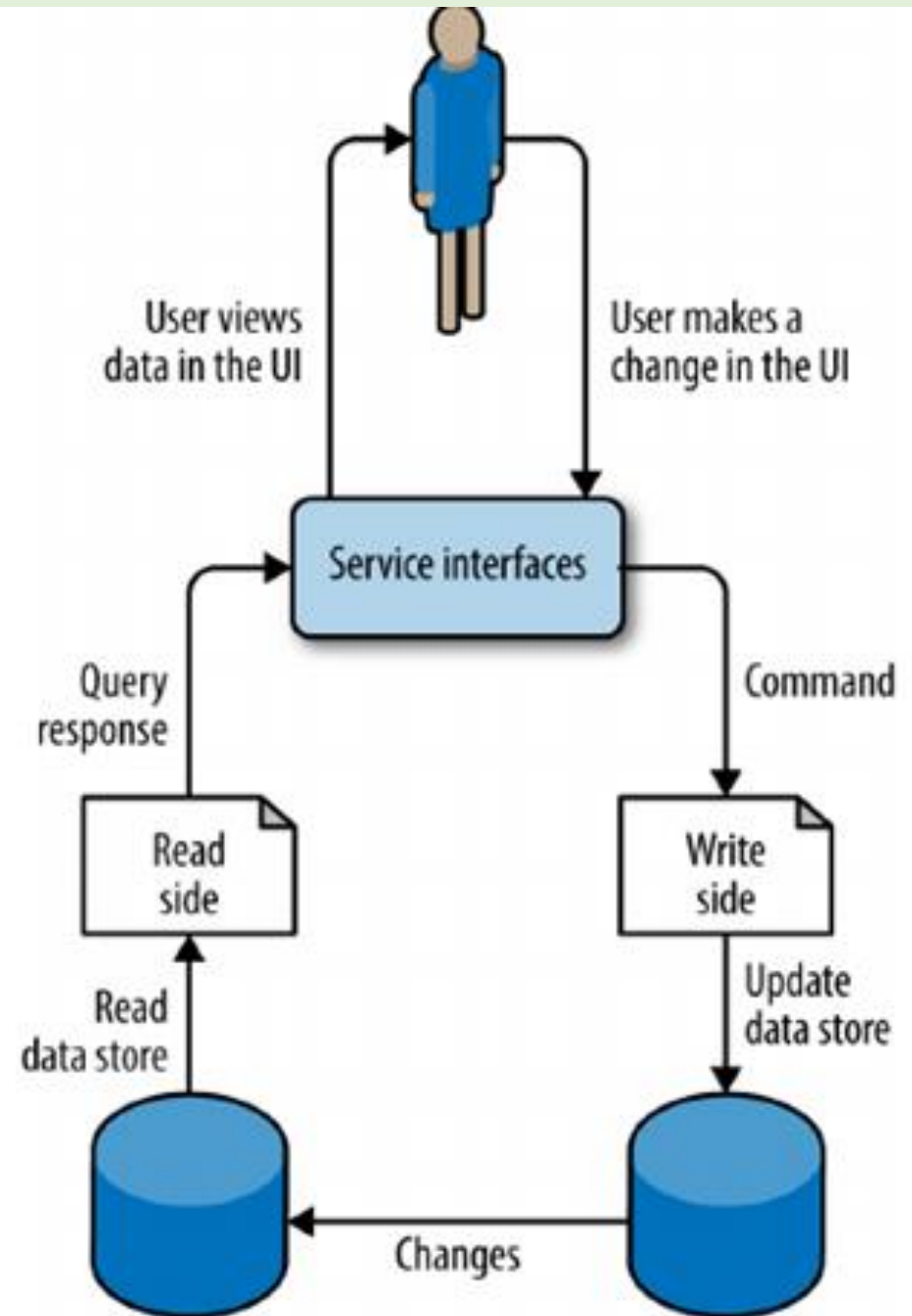
STOSA (Single Team Owned Service Architecture)



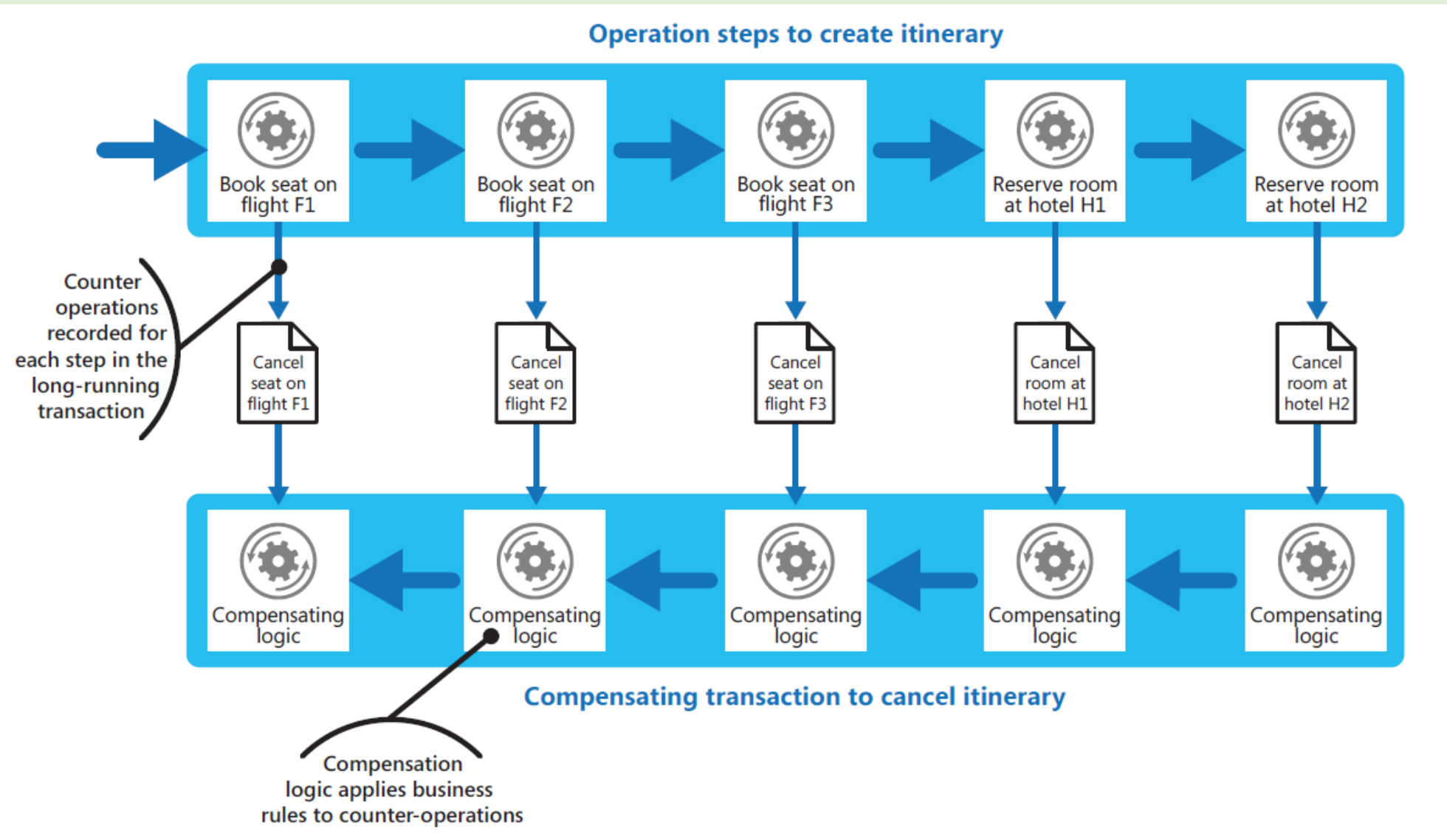
Capability and Experience APIs

Pattern: CQRS

Command Query Responsibility Segregation



Pattern: Compensating Transaction



Compensating Transaction – System Driven vs Customer driven

In many business solutions, failure of a single step does not always necessitate rolling the system back by using a compensating transaction. For example, if—after having booked flights F1, F2, and F3 in the travel website scenario—the customer is unable to reserve a room at hotel H1, it is preferable to offer the customer a room at a different hotel in the same city rather than cancelling the flights.

Pattern: Bulkhead

The bulkhead pattern helps to fix a number of different quality of service related issues.

- Propagation of Failure:** Because solutions are contained and do not share resources (storage, synchronous service-to-service calls, etc.), their associated failures are contained and do not propagate. When a service suffers a programmatic (software) or infrastructure failure, no other service is disrupted.
- Noisy Neighbors:** If implemented properly, network, storage and compute segmentation ensure that abnormally large resource utilization by a service does not affect other services outside of the bulkhead (fault isolation zone).
- Unusual Demand:** The bulkhead protects other resources from services experiencing unpredicted or unusual demand. Other resources do not suffer from TCP port saturation, resulting database deterioration, etc.



Thank You

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